

Verilink AS4000 User Manual

June 2000

P/N 880-503457-001-C



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FCC Requirements

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

This equipment meets the technical criteria specified in the Part 68 rules, sub-part A through F, (for connection of terminal equipment to the telephone network) as well as the requirements specified in AT&T Technical Publications 62411, 54016 and 54019A (ESF).

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) technical publications UL 1950, Third Edition, CAN/CSA-C22.2 No. 950-95, Third Edition, and EN60950:1992.

The following instructions apply specifically to the Octal T1/E1 module

Type of interfaces	1.544 Mbps Digital Channel
Facility Interface	04DU9-BN for SF D4 AMI format without line power 04DU9-DN for SF D4 B8ZS format without line power 04DU9-IKN for ANSI ESF AMI format without line power 04DU9-ISN for ANSI ESF B8ZS format without line power
Service Code	6.ON. Does not provide billing and encoded analog protection. DNX units use an integrated CSU. Affidavit to Telco is required; template provided in back of this manual.
Jack Arrangement	RJ48M
Ringer Equivalence	N/A

This information is provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68: To meet EMI and RFI regulations, a shielded twisted pair cable must be used. The drain wire must be attached to one of the two ground lugs available on the rear bezel. The drain wire connection must be kept as short as possible. In addition, the rear card must be secured to the chassis by means of firmly tightening the card and securing screws on the bezel.

In order for the Octal T1/E1 Module to comply with FCC and European emission requirements, a clamp-on ferrite must be installed on the cable connected to the Octal T1/E1 rear interface. This ferrite is supplied, along with installation instructions, with each Octal T1/E1 rear interface card. See section detailing information on the Octal T1/E1 Module in this manual.

Ferrite No.	IND-003-64151
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The following instructions apply specifically to the Quad T1 module

Type of interface	1.544 Mbps Digital Channel
Facility Interface	04DU9-BN for SuperFrame (SF) D4 AMI format without line power 04DU9-IKN for ANSI ESF AMI format without line power 04DU9-ISN for ANSI ESF B8ZS format without line power
Service Code	6.ON. Does not provide billing and encoded analog protection. DNX units use an integrated CSU. Affidavit to Telco is required.
Jack Arrangement	RJ48C
Ringer Equivalence	N/A

FCC User Requirements

This information is provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68:

1. All direct connections to the T1 digital lines must be made through standard plugs and jacks furnished by the telephone company. No connections can be made to party lines or coin lines. Before connecting your unit, you must do the following:
 - a.) Tell your local telephone company that you have an FCC registered device that you wish to connect to the company's lines. Provide the fourteen-digit FCC registration number listed on the label. The telephone company will also need to know the facility interface code (04DU9-XX) and service code (6.0N) in order to connect the necessary service.
 - b.) Inform the telephone company that you wish to use the RJ48C or RJ48M jack arrangement.
 - c.) After the telephone company has installed the RJ48C or RJ48M jack, you may connect the unit with the appropriate cable.
2. If the unit appears to be malfunctioning, it should be disconnected from the telephone line until the source of the problem is confirmed. If the unit needs repair, it should not be reconnected until after the repair is completed.
3. The unit has been designed to prevent harm to the DDS or T1 network. If the telephone company determines that it is exceeding tolerance parameters, they are permitted to temporarily disconnect service. When possible, the customer will be given advance notice.
4. Under FCC Rules, no customer is authorized to repair the equipment, regardless of its warranty status.
5. If the telephone company alters the equipment in a manner that will affect its usage, advance notice must be given to prevent service interruption.

Normally, Verilink equipment will be used to interface either FCC registered or grandfathered digital terminal equipment to the digital service channel. If the equipment to be connected is not of this type, institutional procedures provide that an affidavit be supplied to the telephone company. This affidavit must state that the system will be operated only by trained individuals and that the signal power at the telephone company interface will not exceed the limits set forth in Part 68 of the FCC's Rules and Regulations.

Industry Canada

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

English

DANGER!

The battery can explode if incorrectly replaced! Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

DANGER!

To avoid electrical shock in case of failure, the power supply must be installed by a professional installer. The terminal labeled with the ground symbol (\equiv) on the power supply must be connected to a permanent earth ground.

CAUTION!

Interconnecting circuits must comply with the requirements of EN60950:1992/A2:1933 Section 6.2 for telecommunications network voltages (TNV) circuits.

Français

ATTENTION!

Une explosion peut se produire si la batterie est remplacée d'une façon incorrecte! Remplacez-la seulement avec le même modèle de batterie ou un modèle équivalent selon les recommandations de manufacture. Disposez de les batteries usées selon les instructions de manufacture.

ATTENTION!

Pour éviter choc électrique en cas de succès, la provision de pouvoir doit être installé par un installateur professionnel. Le terminal de la provision de pouvoir, marqué du symbol de terre, (\equiv) doit connecté à un circuit de terre permanent.

ATTENTION!

Les circuits doivent être interconnectés de manière à ce que l'équipement continue à être en agrément avec "EN60950:1992/A2:1933, Section 6.2, pour les circuits de voltage de liaisons d'échanges (réseau) par les télécommunications (TNV)," après les connexions de circuits.

Españole

PELIGRO!

La bateria puede explotar si se reemplaza incorrectamente. Reemplace la bateria con el mismo tipo de bateria ó una equivalente recomendada por el manufacturero. Disponga de las baterias de acuerdo con las instrucciones del manufacturero.

PELIGRO!

Para evitar contacto con circuitos que electrocutan, la fuente de alimentación debe ser instalada por un técnico profesional. La terminal de la fuente de alimentación marcada con el símbolo de tierra (\equiv) debe ser conectada a un circuito de vuelta por tierra permanente.

CIRCUITOS A INTERCONECTARSE

Circuitos que se interconectan a la red de telecomunicaciones deben hacerse de tal manera que cumplan con los requisitos estipulados en las especificaciones "EN60950:1992/A2:1933, Sección 6.2, para los voltages de circuitos interconectados a la Red de Telecomunicaciones (TNV)," despues de terminar las connecciones entre los circuitos.

Deutsch

VORSICHT!

Explosionsgefahr bei unsachgemäßem Ersetzen der Batterie! Batterie gleichen Typs und gleicher Qualität benutzen, wie vom Hersteller empfohlen. Entsorgung der Batterie nach Anweisung des Herstellers!

VORSICHT, GEFAHR!

Um keinen Schlag zu erhalten beim Versagen der elektrischen Anlage, muss der Stromanschluss von einem Elektriker vorgenommen werden. Der elektrische Pol, versehen mit dem Erdsymbol (\equiv) muss am Stromanschluss permanent geerdet sein.

VORSICHT!

Schaltungen, die in den Geräten zusammengeschaltet sind, müssen weiterhin den Vorschriften EN60950:1992/A2:1933, Absatz 6.2 für Telecommunications Netz Spannung (TNV) Schaltkreise entsprechen.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la class A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

The Industry Canada label identifies CS-03 certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Safety Precautions

This equipment is intended to be installed only in a Restricted Access Location that meets the following criteria:

- Access can only be gained by service personnel or users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that must be taken.
- Access can only be gained through the use of a lock and key or other means of security, and is controlled by the authority responsible for the location.

When handling this equipment, follow these basic safety precautions to reduce the risk of electric shock and injury:

- Follow all warnings and instructions marked on the product and in the manual.
- Unplug the hardware from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a cloth slightly dampened with water.
- Do not place this product on an unstable cart, stand, or table. It may fall, causing serious damage to the product.
- Slots and openings in the shelves are provided for ventilation to protect them from overheating. These openings must not be blocked or covered. Never place this product near a radiator or heat register.
- This product should be operated only from the type of power source indicated on the marking label and manual. If you are unsure of the type of power supply you are using, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will interfere with the free movement of people.
- Do not overload wall outlets and extension cords, as this can result in fire or electric shock.

- Never push objects of any kind into the shelves. They may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on this equipment.
- Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power supply cord or plug is damaged or frayed.
 - b. If liquid has been spilled into the product.
 - c. If the product has been exposed to rain or water.
 - d. If the product has been dropped or if the cabinet has been damaged.

Product Warranty

Verilink's product warranty covers repair or replacement of all equipment under normal use for a two-year period from date of shipment. Our in-house Repair Center services returns within ten working days.

Customer Service

Verilink offers the following services:

- System Engineers at regional sales offices for network design and planning assistance (800) 837-4546
- Technical Assistance Center for free 24x7 telephone support for installation, maintenance, and troubleshooting by telephone at (800) 285-2755 or by e-mail at support@verilink.com
- To return a product, it must be assigned a Return Materials Authorization (RMA) number before sending it to Verilink for repair. To obtain a RMA number, call (800) 926-0085, ext. 2282
- Technical Training on network concepts and Verilink products -- (800) 282-2755 or training@verilink.com
- Web site (www.verilink.com)

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Scope

This manual describes the Verilink AS4000 Integrated Access System. The content of this manual is organized in the following fashion:

This chapter presents an overview of the product.

Chapter 2, “[Quick Set-Up Guide](#)”, provides a step-by-step procedure for an example configuration. It is intended as a guide to the installation process.

Chapter 3, “[Hardware Installation](#)”, describes the AS4000 hardware and hardware installation procedures in detail.

Chapter 4, “[System Menus](#)”, provides complete details on the System Manager Module.

Chapter 5, “[Quad DS-1 Module](#)”, provides complete details on the Quad DS-1 Module.

Chapter 6, “[Quad Port Sync Data Module](#)”, provides complete details on the Quad Port Sync Data Module.

Chapter 7, “[DS-3 Module](#)”, provides complete details on the DS-3 Module.

Chapter 8, “[Test Access Module \(TAM\)](#)”, provides complete details on the Test and Access Module.

Appendix A, “[TFTP and Telnet](#)”, describes the use of Telnet and TFTP for remote access and firmware downloads.

Appendix B, “[Interfaces and Cables](#)”, provides connector pinout and cable information.

NOTE: *Certain product menus and documentation entries refer to additional application modules for the AS4000. These include HDSL, SDSL, DDS OCU and Voice functions. These modules are planned for a future AS4000 release.*

Purpose and Use

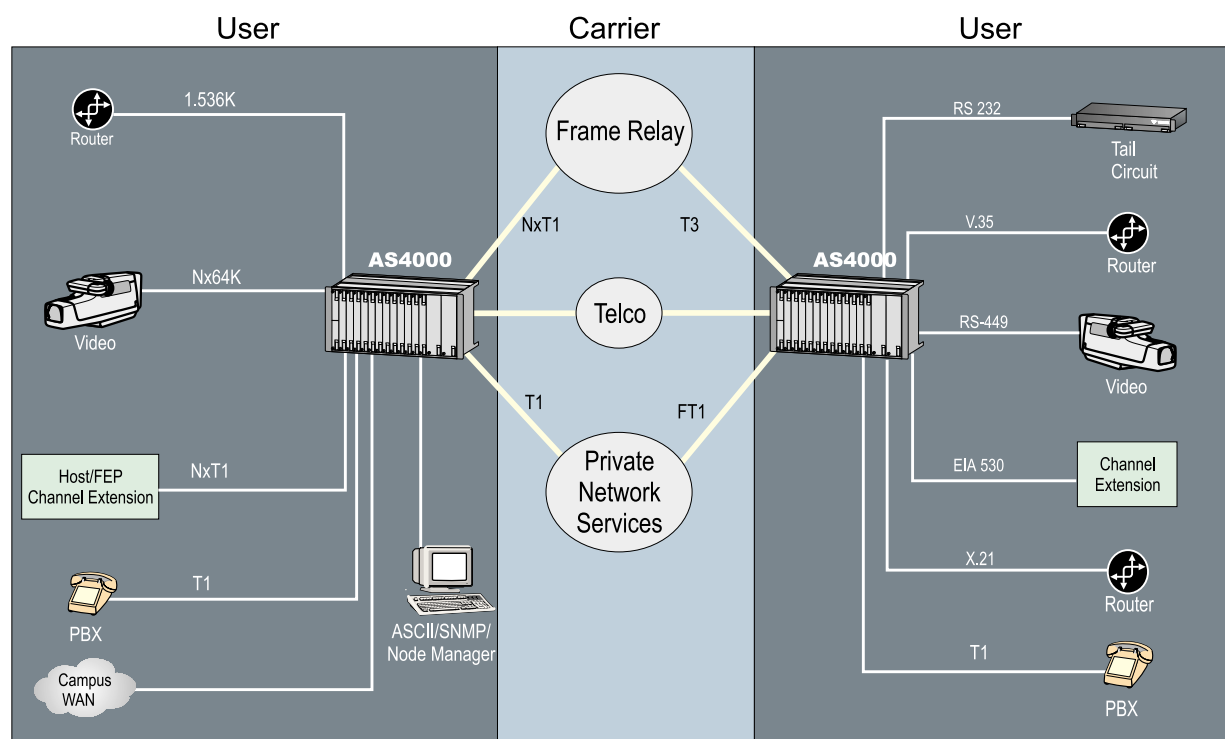
The Access System 4000 (AS4000) is an integrated access device that provides multiple access interfaces to network services for digital voice, data, and video applications. AS4000 is a bandwidth manager of digital services from Level 0 channels (DS0), to Level 3 channels (DS3).

Circuit switching, packet switching, data compression, and routing functions are combined into one platform. The AS4000 enables both circuit-switched and packet-oriented traffic to share the platform for access to wide area networks.

AS4000 Concept

The AS4000 system is modular by design, providing different types of data, network, and management ports. The system's application components are managed by redundant System Manager modules, locally or remotely, and powered by redundant power modules. End-user applications include Local Area Networks (LANs), video conferencing and imaging, digital voice, and remote terminal-to-mainframe connections.

Figure 1-1 AS4000 System



The AS4000 provides network support for private networks, virtual private networks, FT1, T1, and T3. For network management, the Access System 4000:

- Generates and stores non-service-affecting T1 and T3 circuit performance data for circuit analysis and maintenance.
- Generates alarms for fault conditions from incoming network/equipment signals, and reports the alarms to the node controller.
- Stores operator-defined configuration settings required for network and equipment interfaces.

The AS4000 can be a channel bank, an FT3 access multiplexer, or a multi-trunk T1 access node.

Features

The AS4000 uses a dual bus architecture (twin switched busses) with built-in diagnostics, redundant System Managers and power modules, console control, SNMP, Telnet management, user security, and redundant configuration.

Twin Switch Bus Architecture

The TDM (Time Division Multiplexing) switch bus accommodates constant bit rate (CBR) circuit-switched applications such as voice and video. The TDM switch bus accommodates up to 256 Mbit/s of bandwidth. The ATM switch bus addresses the packet-oriented or “bursty” data applications. With one Gbit/s of bandwidth, it is perfect for high-speed connectionless network services.

Midplane Design

The AS4000 employs a midplane design. Each AS4000 has either 4 or 11 slots which can be used for the multiple application modules. There are associated slots in the rear of the AS4000 shelf for the electrical interface modules (one for each front application module).

Built-In Diagnostics

Diagnostic testing can be performed without the need for special test equipment. All application modules support built-in BERT (Bit Error Rate Tester) and loopback tests. Testing is initiated through the console.

LED Indicators

All applications modules have LED indicators that indicate tests, a loopback in progress, or an error condition exists. Refer to the individual modules for more information.

Console Control

The system console provides control of the network from the central site. System configuration and testing can be accomplished by pushing a few keys to select functions and options. The `CONSOLE` port supports terminals that operate at rates of 2400 to 19200 bit/s. Password protection prevents unauthorized access to the console.

User Security

There are four levels of user security:

- View only
- Test
- Provisioning
- Administration

Passwords are encrypted for security purposes. (Please refer to Chapter 4, [“System Menus”](#), for additional information on User Security).

Audit Trail Identifier

Tracks user actions and events. Refer to Chapter 4, [“System Menus”](#), for information on the Audit Trail Identifier.

Copy Configuration

Combines all of the configuration files on an AS4000 into one file and then forwards the one file. Upon receiving the single file, the standby System Manager module extracts the individual files and then resets.

SNMP and Telnet Management

Network management includes performance, error statistics, and alarm gathering. The network administrator can monitor the network on an SNMP management station, through a dialup modem, from a PC anywhere in the network, or with a terminal attached to the AS4000.

System Components

The standard components of the AS4000 system include the shelf, power modules, a System Manager and application modules.

AS4000 Shelf Types

There are two types of shelf units for the AS4000:

- AS4004
- AS4011

NOTE: All application modules are interchangeable between the AS4004 and AS4011 shelf units.

AS4004 Shelf

The AS4004 is the four-slot version of the AS4000 chassis. It comes standard with one System Manager which controls all programming options and one power supply module which drives the system. The AS4004 accommodates up to four application modules with their rear interface modules, and allows for an optional redundant System Manager.

The AS4004 permits the use of many combinations of application and interface modules. For example, install four Quad DS-1 modules and the AS4004 can be used as a sixteen-port DACS.

AS4011 Shelf

The AS4011 is the eleven-slot version of the AS4000 chassis. At minimum it comes with one System Manager module for control and programming options, and one power supply module. An optional redundant System Manager and redundant power supply module are also available.

The AS4011 accommodates up to eleven modules, which provide for the insertion of up to eleven different application and rear interface modules. In the basic configuration, the AS4011 can be used as a forty-four port T1 DACS, or several channel banks within a shelf unit.

AS4000 Application Modules

The AS4000 application modules can access the TDM bus, the ATM bus, or both, depending on the module. This modular approach provides cross-connectivity to a variety of communications applications.

The application module consists of two cards. The front application card and the rear interface card. The front application card contains the switch-bus interface circuitry and control-processor functions.

The rear interface card provides the connectors for the various interfaces (RS-530, T1, XDSL, DS3, etc.). The interface can include DTE and network connectors.

New interfaces are added to existing AS4000 units by the addition of a front and rear application module combination. All modules can be hot-inserted and removed without disrupting the interface module and associated cabling.

Application modules can have more than one rear interface module so that different connector schemes can be supported. [Table 1-1](#) shows the different application modules available for the AS4000.

Table 1-1 AS4000 Application Modules

Module	Function
Quad DS-1 Module	Four T1 links, a microprocessor, and FLASH memory for program storage.
Quad Port Sync Data Module	Four QUAD high-speed links, a microprocessor, and FLASH memory for program storage. The QUAD Port Sync Data Module supports four high-speed synchronous data ports at rates from 48 kbit/s to 2.048 Mbit/s per port.
DS-3 Module	Twenty eight T1 links, a microprocessor, and FLASH memory for program storage.
OCU-DP Module	(Future release)—Four data ports, a microprocessor, and FLASH memory for program storage. The OCU-DP Module supports data rates of 56/64 kbit/s.
Quad DS-1 with XDSL Module	(Future release)—Four T1 links, a microprocessor, and FLASH memory for program storage, the XDSL mini module fits into the rear of the T1 module to extend the length of the T1 line.
Test Access Module (TAM)	Four independent testers send DDS Latching Loopback codes and execute test patterns at 56 and 64 kbit/s.

NOTE: *If an application module is not present in the shelf, you can not access the individual screens associated with it.*

System Manager Module

All of the application modules in an AS4000 system are controlled by the AS4000 System Manager. The System Manager and redundant System Manager occupy two half-height card slots.

The System Manager controls the application modules through two communication buses on the AS4000 midplane. The redundant System Manager is a standby which automatically assumes control if the primary manager fails.

The System Manager module includes a microprocessor, non-volatile FLASH memory for configuration storage, a battery-clock for maintaining the time and date, two ASCII terminal/modem ports, and an Ethernet LAN port for Telnet and SNMP management.

The LAN port is presented as an AUI interface. There is also an optional built-in modem for dial-in access. The System Manager rear interface supports the following connections:

- **AUI**—An Ethernet LAN port labeled AUI provides a DB-15 pin AUI connection.
- **Term Ports**—Two console ports, labeled TERM, provide RJ-11 telco ports for terminal connections.
- **Phone Line**—An RJ-11 port labeled PHONE LINE supports a modem connection.

Redundant Power Supplies

The AS4011 can be equipped with dual load-sharing power supplies. Either supply can operate with a full load. The redundancy can be implemented with two AC supplies or two DC supplies. Each power supply module has its own independent AC and DC inlet.

Timing

Timing is critical to the proper operation of a carrier channel network. All of the equipment in a point-to-point network must refer to a single digital master clock. The System Manager maintains a shelf timing table which designates the current timing master from one of the designated primary, secondary, or tertiary sources. The timing table is configured by the user. Choose different modules within the node as timing controllers.

An AS4000 node must use a common timing source since data is passed between the modules across the shelf midplane. Certain application modules ([Table 1-2](#)) can be selected as the timing source. The System Manager monitors the timing source and displays the new source (as indicated by the shelf timing table) if the original source fails.

Table 1-2 Application Module Timing capabilities

Application Module	Timing Sources
System Manager	<ul style="list-style-type: none"> • Internal clock
Quad DS-1 Module	<ul style="list-style-type: none"> • Internal clock • Network port • External source
T3 Module	<ul style="list-style-type: none"> • Internal clock • Network ports • External source
Quad DS-1 with xDSL Module	<ul style="list-style-type: none"> • Internal • Network ports
Quad Port Sync Data Module	<ul style="list-style-type: none"> • Port 1
OCU-DP Module	
Test Access Module (TAM)	

Specifications

[Table 1-3](#) lists specifications for the AS4000, and [Table 1-4](#) lists power supply specifications.

Table 1-3 AS4000 Specifications

	STANDARDS
FCC Information Part 68	AS4000 Series Octal T1/E1 Interface Bd. GICUSA-27585-DD-N AS4000 Series Quad T1/DS1 Interface Bd. GICUSA-33705-DD-N
UL	Listed per UL1950, Third Edition
CSA	C22.2 No. 0.7
AT&T	Tech Pubs 62411, 54016 and 54019A
Industry Canada Information	AS4000 Series Manager Interface Bd. 2097 9197 A AS4000 Series Octal T1/E1 Interface Bd. 2097 9897 A AS4000 Series Quad T1/DS1 Interface Bd. 2097 9247 A
	USER INTERFACES
Synchronous Data	Input Data Rates: N x 56/64 Kbps to 2048 Mbps Number of Ports: 44 maximum (AS4011), 16 maximum (AS4004) Interfaces: V.35, RS530/422, RS232, X.21
DS-1 Interface	Framing: Full ESF/D4 compatibility, AT&T 62411, 54016, ANSI T1.403 Termination: 8-position RJ48C Number of Ports: 44 maximum (AS4011); 16 maximum (AS4004)
	SWITCHING CAPACITY (non-blocking)
Circuit-switched	256 Mbit/s
Packet (ATM)*	1 Gbit/s
	MECHANICAL
	Dimensions AS4011: 17"W x 10.5"H x 14" D AS4004: 12"W x 5.25"H x 14"D Weight AS4011: 25 lbs. max. AS4004: 14 lbs. max. Mounting AS4011: 19" or 23" rack AS4004: tabletop or rack Power 90-230 VAC, 47-63 Hz, 24-72 VDC Environment 0-40 degrees C., 90% Humidity (non-condensing)

Table 1-4 AS4000 Power Supplies

AS4011	AS4004
<p>DC Inputs: -48VDC Power Input (range 38 to 60 VDC), 250W max. (Approvals based on 48+/-10%; 43.2-52.8VDC Talk Battery (5A max.) -48VDC Signalling Battery (5A max.) Maximum heat dissipation in unit from Talk and Signalling Battery is 120W. Maximum total heat dissipation in unit is therefore 370W.</p> <p>AC Input: 110VAC 47 to 63 Hz (Range 90 to 132VAC), 250W max. (Approvals based on 100 to 240, +6%-10% 200W), 220VAC 47 to 63 Hz (Range 180 to 264VAC), 250W max.</p>	<p>DC Inputs: -24VDC (range 21.6 to 36VDC), 100W 26.4VDC. (Approvals based on 24+/-10%; 21.6 to 26.4VDC -48VDC power input (range 43-56VDC), 100W (Approvals based on 48+/-10%; 43.2 to 52.8VDC) -48VDC Talk Battery (1.5A max.) -48VDC Signalling Battery (1.5A max.) Maximum heat dissipation in unit from Talk and Signalling Battery is 48W. Total heat dissipation in DC unit is therefore 148W maximum.</p> <p>AC Input: 110VAC or 220VAC, 47 to 63Hz (range 90 to 264VAC), 125W (Approvals will be based on rating 100 to 240VAC, +6%/-10%)</p>

Quick Set-Up Guide

This chapter is a step-by-step guide for installing the AS4000. For the purpose of this chapter certain assumptions have been made about module selections, circuit design and network architecture. These almost certainly will not match your situation. Use this chapter as a guide to the process of installing the AS4000, rather than a literal set of instructions.

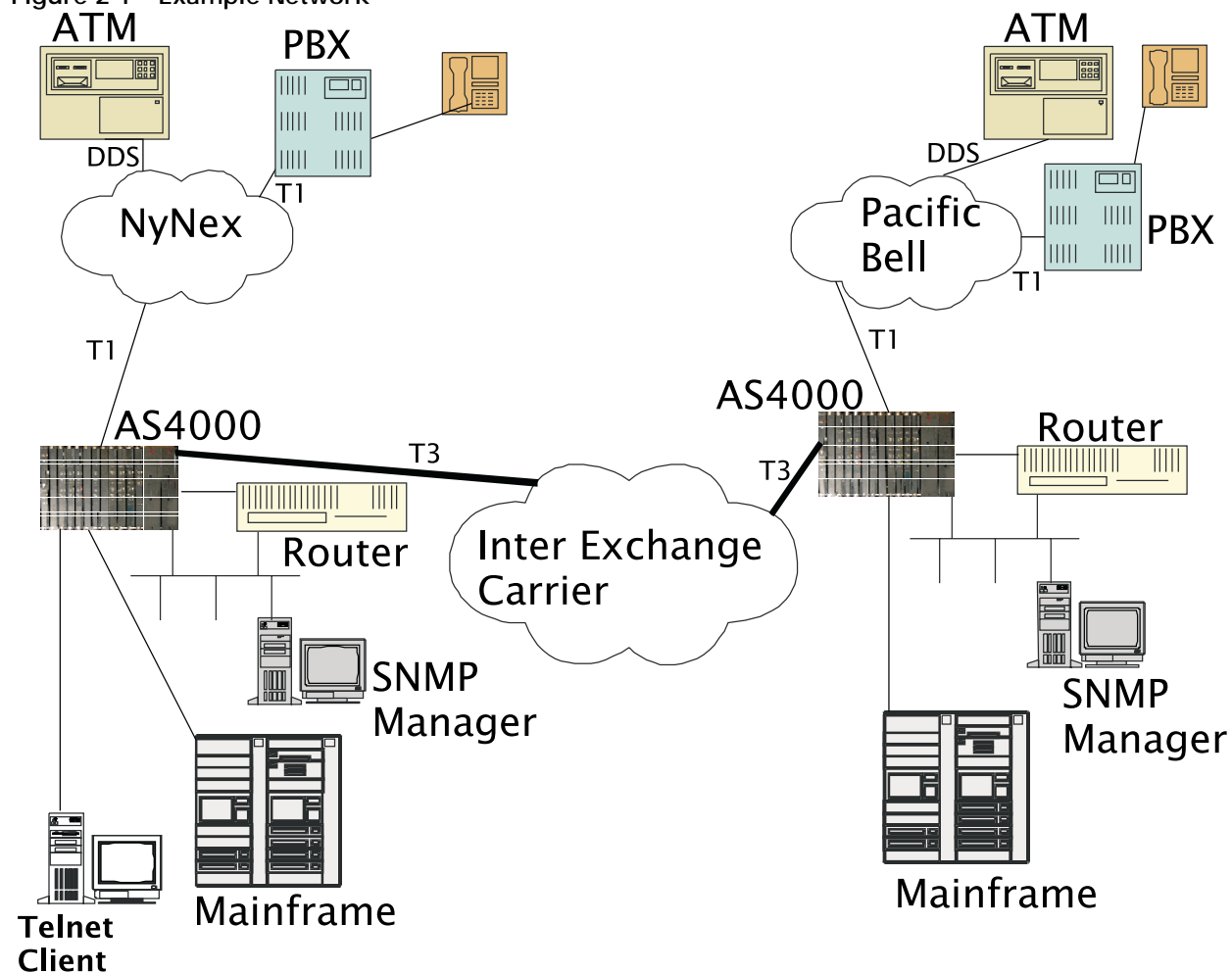
Complete details on hardware installation, system menus and the various application modules are in the chapters which follow.

Example Network Scenario

The following assumptions are made about the example network described in this chapter.

- The customer is an American firm, MegaBank Corporation. They have large data centers in the San Francisco Bay area and the greater New York City area. These two data centers are connected with a T3 circuit. DS-3 Modules are used for this link.
- At each of the data centers, a fractional T1 circuit is used to connect Automatic Teller Machines (ATMs) running a polled, synchronous protocol to a mainframe through a Front End Processor. The local exchange company connects 32 remote ATM locations, combining eight multipoint DDS circuits into each of 4 timeslots in a fractional T1 to the data center. In this way, sessions are simultaneously supported to 32 remote ATMs at 56 Kbit/s each, using only 256 Kbit/s of T1 bandwidth. These four circuits connect via a Quad Sync Data Port module to 4 FEP ports.
- At each data center TCP/IP routers connect the two local LAN networks. These routers are connected to Quad Sync Port Data Modules using a V.35 electrical interface.
- Voice PBXs at the MegaBank branches connect branch employees to the data centers. The local carrier routes these T1 circuits to each data center. Quad DS-1 modules are used for these connections.
- Your task for this example configuration will be to install and configure the equipment at the west coast data center, the site shown on the right side in [Figure 2-1](#).

Figure 2-1 Example Network



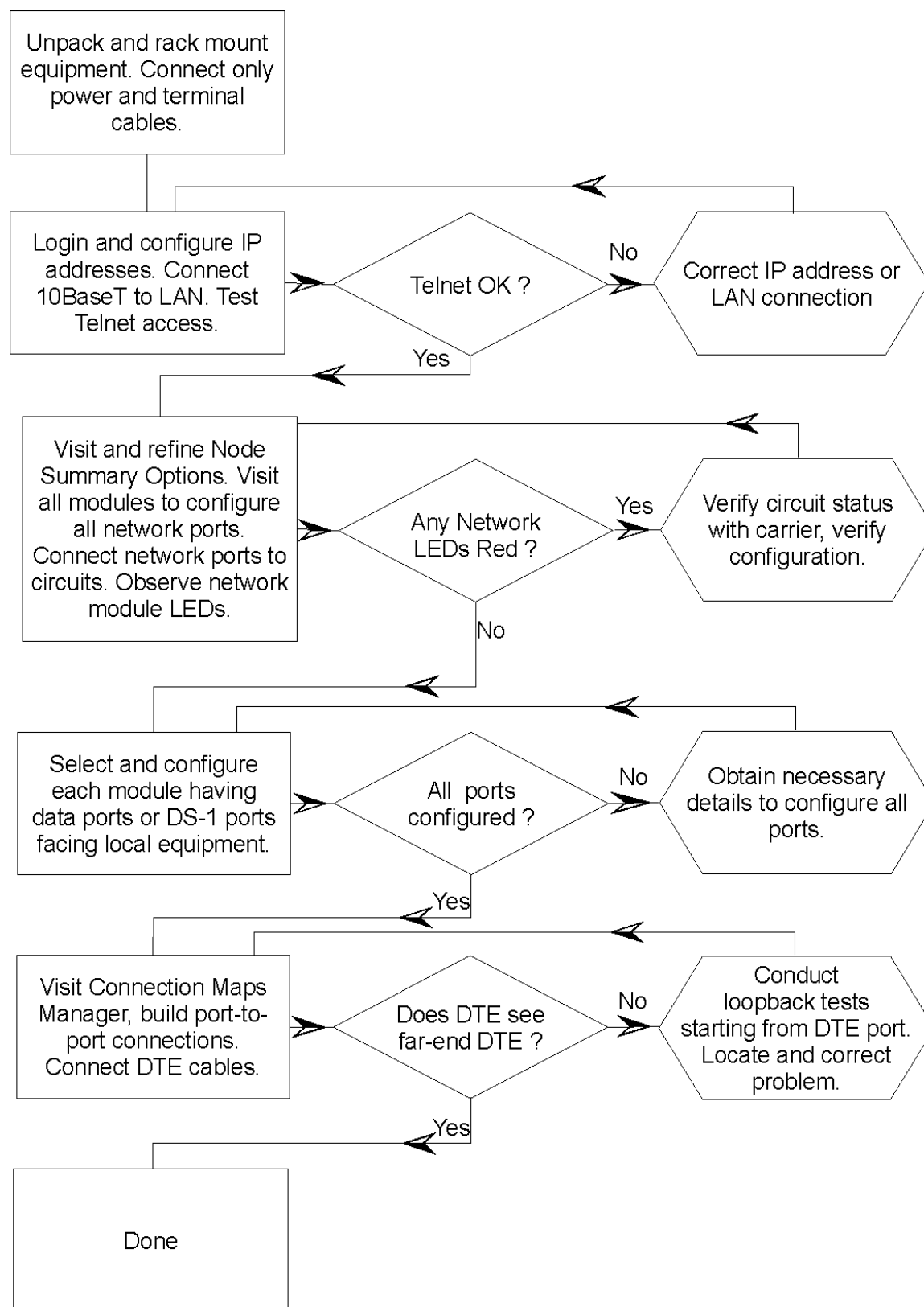
Work Flow

The four major tasks of the installation are:

- Physical Installation
- System Configuration
- Port Configuration
- Connection Mapping

A basic work flow diagram is provided in [Figure 2-2](#).

Figure 2-2 Example Work Flow



Step-by-Step

Physical Installation

To install this example configuration perform the following steps.

1. Unpack all of the AS4000 equipment, mount the shelf in a 19-inch rack. Insert all modules in their slots first, then power up the shelf. This lets the System Manager detect the installed modules at power-up, saving time later.
2. Connect the COM port of a notebook computer or an ASCII terminal to the port labelled TERM on the System Manager rear interface card.

NOTE: The cable provided for connecting to the console includes a DB-25 male to 6-pin modular adapter (P/N CBE 010 00002). This will connect directly to many terminals. For connection to a typical PC COM port add a DB-9F to DB-25F adapter.

3. Configure the terminal or PC terminal emulator for the following parameters:

Table 2-1 Terminal Settings

Data Rate	19,200 bit/s (or lower)
Word Size	8 data bits
Parity	none
Stop Bits	one
Flow Control	none
Terminal Emulation	VT-100 (or as desired)

4. On the terminal or PC, press ENTER until a **login** prompt appears, requesting a user name. Initially there are no user names, so just press ENTER again.
5. A **password** prompt appears. Initially there are no passwords, so just press ENTER again.
6. Depending on the nature and configuration of your terminal or terminal program—a menu may appear asking you to select a terminal emulation type. You must know what terminal emulation you are using and make an appropriate selection or the screens which follow will be garbled and difficult to read. If you are using VT-100 emulation choose option 9.
7. The AS4000 **Main Menu** appears.

Figure 2-3 Main Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
Databases: InSync	Power Supplies: [A - Ok][B - Ok]
Pubs & Training		
Node Summary		
Connection Maps Manager		
System Configuration		
Events		
Utilities		
About		

- Configure System** 8. Select System Configuration. The **System Configuration Menu** appears.

Figure 2-4 System Configuration Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
System Configuration Menu		
Slot Configuration		
System Clock Source Menu		
Users Menu		
Port IP Addresses		
SNMP Agent Configuration		
Date and Time		
Node Name		
Save and Restore Database		

9. Select the **Users Menu**, add an account with administrative access. There must always be at least one account with administrative access, there may be more than one. When done adding users press "X" to exit; save your changes.

NOTE: Be certain to create a user account with administrative privilege during your first terminal session. Until an administrative level account is created, a user giving no user name and no password has administrative level access.

Figure 2-5 Users Menu

```

VeriLink Corporation          AS4011 - System Manager          Help = [?]

                                Users Profile Manager

Name      Id      Rights      Status      Name      Id      Rights      Status
-----
Steve      01      Admin      Logged In
Net_Ops    02      Provision
Executives 03      View Only
Maintenance 05      Test
Test       15      Admin

```

10. Select Port IP Addresses. The **Port IP Addresses Menu** appears.

Figure 2-6 Port IP Addresses Menu

```

VeriLink Corporation          AS4011 - System Manager          Help = [?]

Port Configuration Menu

IP encapsulation.....: Ethernet II
LAN IP address.....: 208.150.145.141
LAN IP mask.....: 255.255.255.0

Enable RIP.....: No
Default gateway (if RIP disabled): 208.150.145.1

Backplane IP address.....: 200.0.0.0
Backplane IP mask.....: 255.255.255.0

Backplane IP Address Management
-----

Backplane IP translation.....: No
Configure slot's IP table

```

11. Set the IP encapsulation to Ethernet II. Set the IP address and subnet mask per the information provided by your network administrator. Do not use the values shown unless you have confirmed that they are correct for this LAN segment. Leave the Enable RIP selection set to No. Set the Default Gateway option for the IP address of the router on this LAN segment. Use "X" to exit this menu. Save your changes. Test the IP configuration by having someone Telnet to the AS4000 node. Have them log in using the administrative password you created in [Step 9](#).
12. Select **Date and Time**, correct date and time information as needed. Use "X" to exit this menu. Save your changes.

Figure 2-7 Date and Time Menu

VeriLink Corporation	AS4011 - System Manager	Hel p = [?]
Date and Time Menu		
Month.....: March		
Day.....: 29		
Year.....: 1999		
Hour.....: 11		
Mi nute.....: 4		
Second....: 28		
Day.....: Monday		

13. Select **SNMP Configuration**. Set the System Group Parameters per your network administrator. Set the Trap host IP addresses to equal the IP address of each network management computer to which this AS4000 should send alarms. Set the read and write community strings to match those used by the SNMP manager.

Figure 2-8 SNMP Configuration Menu

VeriLink Corporation		AS4011 - System Manager		Help = [?]	
SNMP Agent Configuration Menu					
System Group Parameters					

System domain name....: Tech Pubs & Training					
System description....: VeriLink Corporation		AS4011 - System Manager			
System location.....: San Jose, CA					
System contact.....: Center Manager					
Trap Controls					

Traps.....: Enabled					
Authentication traps...: Enabled					
Client-manager IP Addresses			Community Profiles		
-----			-----		
(used for trap destinations)			Read-only:		Read-write:
192.94.45.229	0.0.0.0		private		private
192.94.45.1	0.0.0.0		public		private
0.0.0.0	0.0.0.0		public		private
0.0.0.0	0.0.0.0		public		private

14. Exit from the **System Configuration Menu** by pressing "X".

Configure the Ports

15. Select the **Node Summary Menu**. Verify that the listed slots match the installed hardware. If you installed all modules before applying power to the shelf, this list should be complete and accurate.

Figure 2-9 Node Summary Menu

```

Verilink Corporation
Databases: InSync
AS4011 - System Manager
Help = [?]

Node Summary Menu

Slot#   Configured Type   Actual Type   Status
-----
01)     T3                 T3           OK
02)     Quad High Speed    Quad High Speed  OK
03)     Quad High Speed    Quad High Speed  OK
04)     ----              ----          Not Present
05)     Quad T-1           Quad T-1       OK *
06)     Quad T-1           Quad T-1       OK *
07)     Quad T-1           Quad T-1       OK
08)     Quad T-1           Quad T-1       OK
09)     ----              ----          Not Present

```

16. The T3 module is already under the cursor because it is in slot 1. Press **ENTER** to select the DS-3 module. The **Main Menu** for the DS-3 module appears.

Figure 2-10 DS-3 Main Menu

```
VeriLink Corporation          AS4000 - T3          Slot: 01      Help = [?]

                                Main Menu
                                -----

                                Configuration
                                Diagnostics
                                Utilities
                                About

Navigate menu      = [Space/Backspace]
Change parameter = [Return/'B']
Exit/abort edits = ['X' /Esc]
```

17. Select the **Configuration Menu**.

Figure 2-11 DS-3 Configuration Menu

Veri link Corporation	AS4000 - T3	Slot: 01	Help = [?]
<p>Configuration Menu</p> <p>-----</p> <p>T1 Configuration</p> <p>T3 Configuration</p> <p>Options</p>			
<p>Navigate menu = [Space/Backspace]</p> <p>Change parameter = [Return/' B']</p> <p>Exit/abort edits = [' X' /Esc]</p>			

18. Select the **T1 Configuration Menu** and set the first T1 circuit for ESF framing, Clear density enforcement and In Service. Copy this configuration to all 28 T1s for this DS-3 module. Exit the menu by pressing "X" and save your changes.
19. Select the **T3 Port Configuration Menu**. The first eight fields are informational, set the values per the information provided by the carrier. Select C-bit Parity format, and short cable = yes. Exit this menu by pressing "X", save your changes. Press "X" two more times to return to the **Node Summary Menu**.
20. Connect the T3 circuit to the DS-3 module. Observe that the DS-3 Sync LED and the DS-1 Sync LED both turn green within 15 seconds.

Figure 2-12 T3 Port Configuration Menu

VeriLink Corporation	AS4000 - T3	Slot: 01	Help = [?]
T-3 port configuration			
Name.....: Circuit Number			
Unit.....: DefU			
Facility Id.....: Def - Facility Id			
Port Number.....: Def - Port No.			
Generator #.....: Def - Generator No.			
Equipment Id.....: Def - EID			
Location Id.....: Def - LID			
Frame Id.....: Def - FID			
M13 Operating Mode.....: C-Bit Parity			
Rcv Loop Timing.....: Disabled			
Short Cable < 50'.....: Yes			
M13 Remote Loopback Type: 3rd C-Bit & Stuff Bit Inverted			
Rcv AIS Selection.....: Framed 1010, C & X Bits disregarded			
Xmit AIS Selection.....: ANSI			
Navigate menu = [Space/Backspace]			
Change parameter = [Return/'B']			
Exit/abort edits = ['X'/Esc]			

21. On the **Node Summary Menu**, use the SPACE BAR to navigate to the next installed module—the Quad Sync Data Port module in slot 2. Press ENTER. The **QHS Main Menu** (Figure 2-13) appears.

Figure 2-13 Quad Sync Data Port Main Menu

VeriLink Corporation	AS4000 - Quad High Speed	Slot: 02	Help = [?]
QHS Main Menu			
Configuration			
Diagnostics			
Utilities			
About			

22. Select **Configuration**, the **Configuration Menu** appears. Verify that all ports are in service with timing set to internal. Use "X" to exit, and "X" again to return to the **Node Summary Menu**.

Figure 2-14 Quad Sync Data Port Configuration Menu

VeriLink Corporation	AS4000 - Quad High Speed	Slot: 02	Help = [?]
Configuration Menu			
Port 1	Port 2	Port 3	Port 4
Name.....:port name	port name	port name	port name
Speed.....:1536000	0	0	0
Timing.....:Internal	Internal	Internal	Internal
DCD out.....:Forced On	Forced On	Forced On	Forced On
DSR out.....:Forced On	Forced On	Forced On	Forced On
Data.....:Normal	Normal	Normal	Normal
Clock.....:Normal	Normal	Normal	Normal
Interface....:V. 35	V. 35	V. 35	V. 35
V. 54 Loop....:Disabled	Disabled	Disabled	Disabled
Connect Event:Disabled	Disabled	Disabled	Disabled
Port Status...:In Service	In Service	In Service	In Service
Cascade Leds when Idle: Yes			

23. At the **Node Summary Menu**, select the next installed module—the Quad Sync Data Port module in slot 3. Repeat the [Step 22](#) for this module. Then select the DS-1 module in slot 5. Press ENTER to access the **Quad DS-1 Main Menu**.

Figure 2-15 Quad DS-1 Main Menu

VeriLink Corporation	AS4000 - Quad T1	Slot: 05	Help = [?]
QT1 Main Menu			
Configuration Statistics Diagnostics Utilities About			

24. Select the **Quad DS-1 Configuration Menu**.

Figure 2-16 Quad DS-1 T1 Port Configuration Menu

Verilink Corporation		AS4000 - Quad T1		Slot: 05	Help = [?]
Quad T-1 card port configuration					
	Port #1	Port #2	Port #3	Port #4	
Name.....:	Port #1	Port #2	Port #3	Port #4	
Framing.....:	ESF	ESF	ESF	ESF	
Line code....:	B8ZS	B8ZS	B8ZS	B8ZS	
LB0.....:	0 db	0 db	0 db	0 db	
Density.....:	Clear	Clear	Clear	Clear	
Ntwk loops...:	Enable	Enable	Enable	Enable	
Yellow alarm:	Yes	Yes	Yes	Yes	
ESF format...:	54016	54016	54016	54016	
Unused DS0's:	Busy	Busy	Busy	Busy	
Port Status :	In Service	In Service	In Service	In Service	
Cascade Leds when Idle: Yes					

25. Set all four T1 ports to ESF framing, B8ZS line coding, 0 db line build out, Clear density enforcement, Busy unused DS0s and In Service status. Use "X" to exit this menu, save your changes, and press "X" again to return to the **Node Summary Menu**. Press "X" once more to return to the System Manager **Main Menu**. Connect all of the Quad DS-1 T1 ports to their respective T1 circuits. Observe that within 15 seconds the alarm LEDs on the Quad DS-1 module are not lit.
26. On the System Manager **Main Menu**, select Connection Maps Manager. The **Connections Map Manager Menu** appears.

Figure 2-17 Connection Maps Manager Menu

Verilink Corporation		AS4000 - Quad High Speed		Slot: 02	Help = [?]
Active Map: Map 01					
Connection Maps Manager Menu					
Active Map Map Configuration Map Definition Time of Day Configuration Date and Time Save and Restore Database					

Build Connections

27. On the **Connection Maps Manager Menu**, select Active Map. The current map configuration is displayed. Initially there are no entries because no connections (circuits) have been built.
28. Press "A" to begin the process of adding a connection to the map. The cursor appears over the Connection Name field, which is currently blank. Press ENTER to begin the process of editing the connection name. Type "First T1" and press ENTER again to finish entering the name.
29. Leave the type set at Full Duplex, for the Source Slot select 01, the location of the DS-3 module. Proceed to the Source Port selection. A DS-3 module only has one network port. In the case of a DS-3 module, the Source Slot option refers to the particular T1 of the 28 T1s which a T3 contains. Select 01.
30. The Starting Source Timeslot option selects the first DS0 within the specified DS1 to be used for this connection. Leave it at 01. Proceed to the Destination Slot selection field. Select the Quad DS-1 module in slot 5. Select the first of the four T1 ports in that module for the Destination Port. Leave the starting destination timeslot set for 01.
31. Proceed to selecting the speed for this connection. Scroll through the list of selectable speeds until 1.536 Mbit/s and 24 DS0s are selected. Set the voice data selection to Voice. Save using "S" and exit this menu. The first connection now appears in the summary on the **Map Configuration Menu**.

Figure 2-18 Example Connection

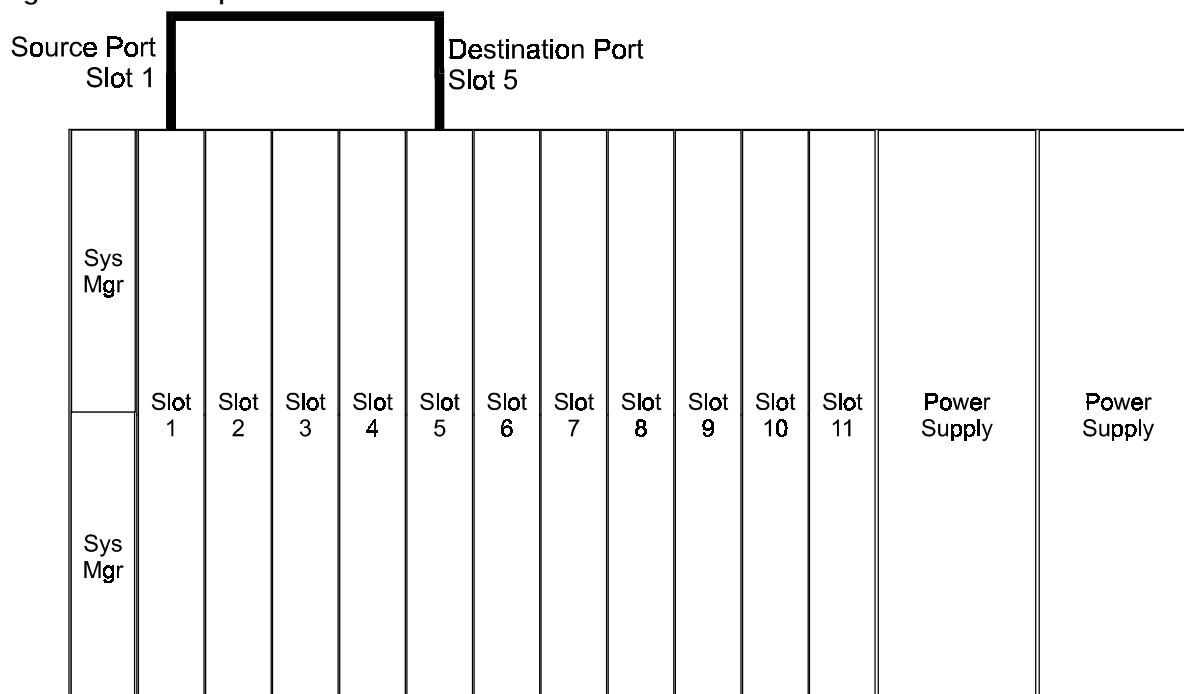


Figure 2-19 Map Configuration Menu

```

Verilink Corporation          AS4011 - System Manager          Slot: 02      Help = [?]

                          Map Configuration:   Map 01
Note: You must exit this menu in order to update the switch map

Name                        Src      Dest    Speed Type    Active Test  Tester Port
-----
First T1                   01.03.01  05.01.01  1536k V    FDX
--
--
--
--
--
--
--
--
--
--
--

Connection Filter: Not Active

[F]ilter                    [A]dd/[L]isten/[D]elete connection
[T]est set up/[R]estore    [H]ome/[E]nd/[N]ext/[P]rev page

```

32. Add like connections for the other three T1 ports on the Quad DS-1 module. Map T1 port 2 to the second T1 of the 28 multiplexed into the DS-3 module network port. Map Quad DS-1 port 3 to the third T1 in the T3. Map port 4 to T1 number four. These connections allow the branch offices to connect to the main telephone switch in New York. At the New York site the first four T1 circuits are mapped to a Quad DS-1 which has four short haul connections to ports on the main telephone switch.
33. Add connections according to [Table 2-2](#). These four Quad DS-1 ports connect to local voice switch DSX-1 interfaces to support phone traffic to MegaBank east coast branches.

Table 2-2 Quad DS-1 Connections

Source				Destination			
Slot	Module	Port	DSOs	Slot	Module	Port	DSOs
1	DS-3	T1-5	All	7	DS-1	1	All
1	DS-3	T1-6	All	7	DS-1	2	All
1	DS-3	T1-7	All	7	DS-1	3	All
1	DS-3	T1-8	All	7	DS-1	4	All

34. Map the first four timeslots of the first T1 port on the Quad DS-1 Module in slot 8 to the four data ports on the Quad Sync High Speed Data module in slot 2 of the shelf. Set the data rate of each connection at 56 Kbit/s. This supports the four DDS multipoint circuits, with eight remote sites each, with MegaBank Corp remote ATM. Cable the four ports of the Quad DS-1 module in slot 2 to the appropriate ports on the FEP. Verify that the ATM machines at the branches are responding to the polled synchronous protocol used by MegaBank Corp.
35. Map each of the four data ports on the Quad Sync Data Port module in slot 3 to a T1 in the DS-3 module in slot 1. Use T1 numbers 9 through 12 in the T3. Set each connection at 1.536 Mbit/s. These support router to router communications between the two data centers. Verify that the routers at each site can "see" each other.
36. Document your installation.

Backup Files

This completes the example configuration. You may wish to save the configuration files to a PC on the network using TFTP. See the section [“Save and Restore Database Menu”](#), on page 4-18.

More Information

For more detailed information on AS4000 refer to the following:

Chapter 3, [“Hardware Installation”](#) describes the AS4000 hardware and hardware installation procedures in detail.

Chapter 4, [“System Menus”](#) provides complete details on the System Manager Module and general node configuration.

Chapter 5, [“Quad DS-1 Module”](#) provides complete details on the Quad DS-1 Module.

Chapter 6, [“Quad Port Sync Data Module”](#) provides complete details on the Quad Sync Data Port Module.

Chapter 7, [“DS-3 Module”](#) provides complete details on the DS-3 Module.

Chapter 8, [“Test Access Module \(TAM\)”](#) provides complete details on the Test and Access Module.

Appendix A, [“TFTP and Telnet”](#) describes the use of Telnet and TFTP for remote access and firmware downloads.

Appendix B, [“Interfaces and Cables”](#) provides connector pinout and cable information.

Chapter 3

Hardware Installation

This chapter provides detailed information for AS4000 hardware installation. This chapter includes procedures, required tools and supplies, and general information for component configuration. Refer to the shelf planning worksheet when installing the system components.

Required Hardware and Tools

To install the Access System 4000 components, the following tools and hardware are recommended:

- Cross-tip (phillips) screwdriver for securing shelves to the equipment rack
- Small adjustable crescent wrench (adjustable spanner)
- Small straight-slot screwdriver for setting the address switch
- Anti-static wrist strap
- Digital voltmeter for testing system power
- Network interface and equipment cables
- Fuse panel and fuses
- 12- through 22-gauge wire (for DC power)

Equipment Inspection

WARNING

The AS4000 system components contain electrostatic-sensitive circuits. Before handling components, wear an anti-static wrist strap connected to frame ground to prevent damage to circuits from electrostatic discharge.

Unpack the AS4000 components and inspect for possible damage:

- Shelf units
- Power supplies
- All application modules

Repack the application modules and rear connector modules in their respective anti-static envelopes until everything else is assembled and you are ready to install them.

Wiring for DC Power

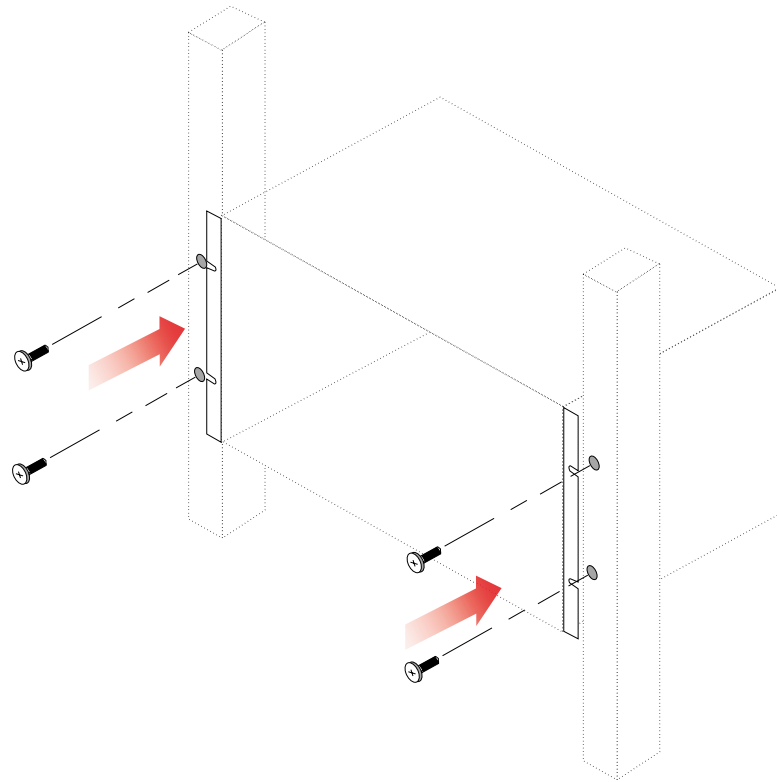
Wiring for the office battery power and ground connections to the DC power module are not provided by Verilink. Use one of the following wire gauges for the 48 VDC and battery return runs:

- 18-gauge solid wire. Both wires total 40 feet (12.2 meters) or less.
- 14-gauge solid wire. Both wires total 40 to 65 feet (12.2 to 20 meters).

Shelf Mounting

The AS4000 has mounting brackets molded to the shelf front face for rack installation. The mounting brackets have been designed to mount the shelves in a 19 inch equipment rack. The AS4000 is a front-mounted shelf unit ([Figure 3-1](#)).

Figure 3-1 Shelf Mounting



37. Position the shelf at the designated location within the equipment rack .
38. Secure shelf into place with machine screws.

Installing Power Supplies

This section describes the application of power to the AS4000.

Applying AC Power

To apply power to the AS4000, do the following:

1. Plug the 115 VAC power supply into the AC outlet.

NOTE: *If your site has UPS power, Verilink recommends connecting one AC power supply to the UPS and the other power supply directly to local commercial power. If there is a failure of the UPS, service can continue.*

2. Verify that the Power LED is lit on the power supply front panel. If the LED is not lit, verify the voltage at the AC power outlet.

WARNING

Verilink AC power supplies require a three-prong grounded receptacle. Do not use an adapter to connect these plugs to an ungrounded receptacle.

DC Power Connections

Use the following procedures to connect the DC power to the AS4000.

NOTE: When powering AS4000 from a 48V battery, use two separate fuse panels or a fuse panel with redundant (A and B) fuse positions.

Connect the shelf to the fuse panel by doing the following:

1. Insert the negative wire into the connector labeled -48V.
2. Connect the positive wire to the terminal labeled RTN.
3. Torque connector wire set screws to 4.5 to 8.0 inch lb (0.5 Nm to 0.9 Nm).

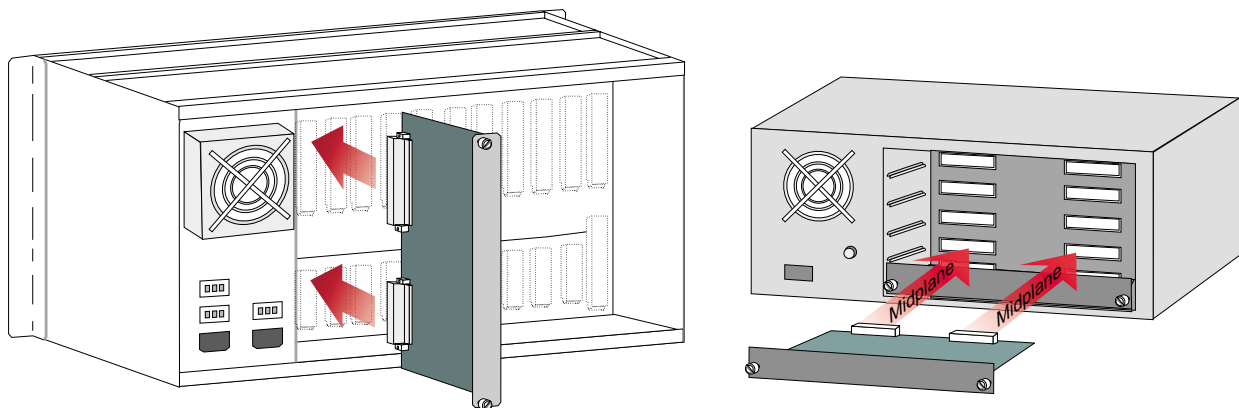
Installing Application Modules

This section installs the application module into an AS4011 and a AS4004. Refer to the system configuration worksheet to match the rear interface card to the corresponding front application card.

Rear Interface Card

Figure 3-2 illustrates a AS4000 rear interface card installation. To install the rear interface card, do the following:

Figure 3-2 Rear Connector Card Installation

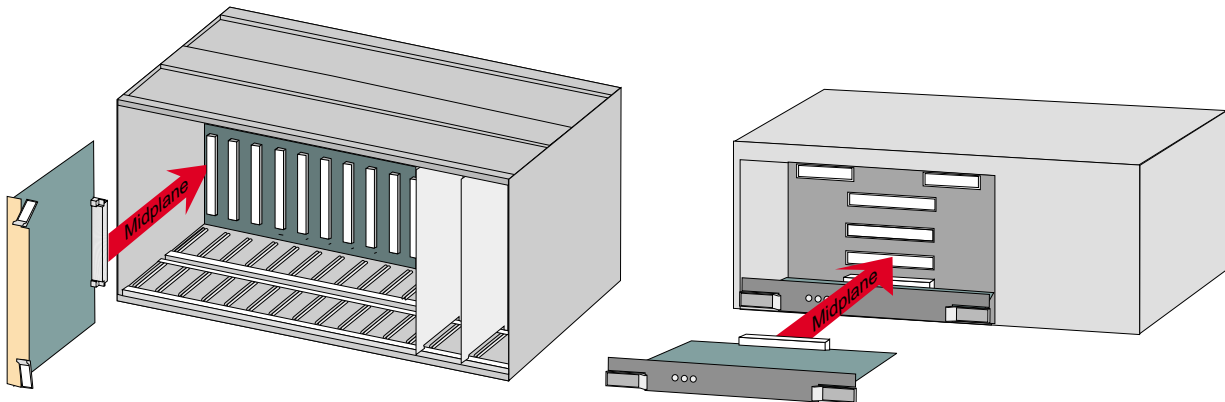


1. Slide the rear connector module into the back of the assigned shelf slot, ensuring both connectors mate with the corresponding shelf connectors.
2. Verify the top and bottom of the interface card is flush with the shelf.
3. Secure the rear interface card by tightening the two thumb screws finger-tight on the ends of the panel.
4. Repeat the above procedure for each remaining rear interface card.

Installing the Application Card

To install the application card, do the following:

Figure 3-3 Application Module Installation into a Multi-line Shelf



1. Slide each application card into its assigned slot until it seats in the midplane (Figure 3-3).
2. Position the ejector handles flush with the faceplate, locking the application module into the shelf.
3. Secure the front application card by tightening the two thumb screws finger tight on the ends of the panel.

CAUTION

All shelf slots must be filled with an application module or a face plate. Failure to fill all shelf slots can result in Radio Frequency Interference (RFI). See the FCC Statement advisory in the front matter of this manual.

AS4000 Cabling

All AS4000 cables meet national and international standards.

[Figure 3-4](#) provides an overview of the AS4000 cabling.

Figure 3-4 AS4000 Cabling

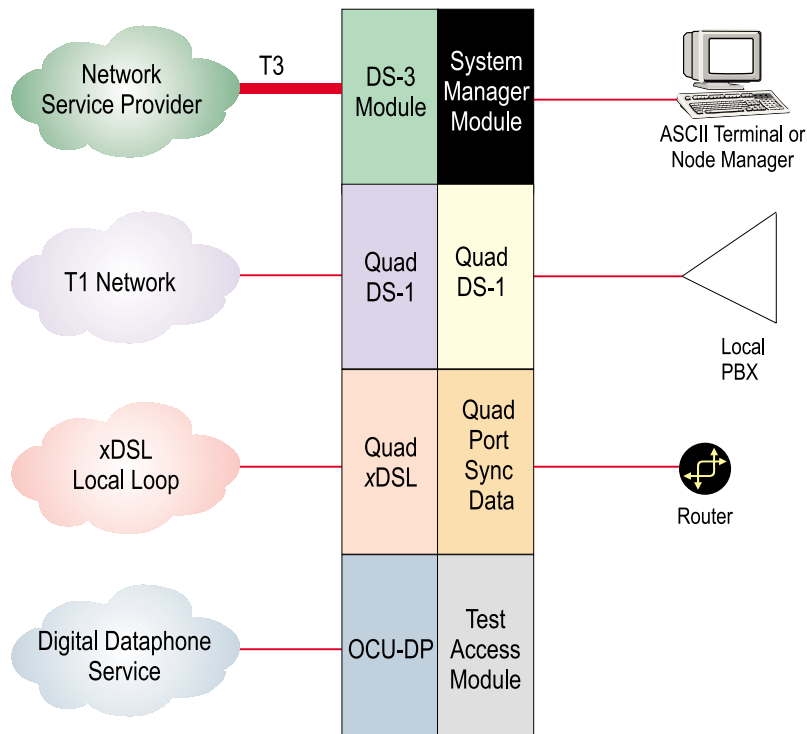


Table 3-1 AS4000 Cable Usage

Cable Type	Usage
Network interface cables	Connects a network port to a network service. Uses RJ-48C, RJ-48S, BNC or 50-pin Amphenol connectors.
DSX-1 T1 equipment cables	Used for T1 signal connections between a QUAD T1 and T1 equipment.
DTE cables	Used to connect the AS4000 to the customer's DTE.
Terminal interface cables	Used to connect an ASCII terminal to an SCM.
Network management cables	Used to connect network management software to the AS4000 node.

ASCII Terminal Connection

Connect the ASCII terminal directly to the TERM port on the System Manager module. Connect the other end of the terminal cable to your PC or terminal. The length of this connection cannot exceed 50 feet (15 meters).

Network Connections

Connect the network cables only after the individual modules have been configured. See individual modules' user manuals for more information.

Chapter 4

System Menus

This chapter describes the AS4000 **System Menu** structure. It does not describe the individual modules installed in the AS4000. Those menus are described in the following chapters.

The specific configuration information for the individual application modules may be found as outlined below:

Chapter 5: [“Quad DS-1 Module”](#).

Chapter 6: [“Quad Port Sync Data Module”](#).

Chapter 7: [“DS-3 Module”](#).

Chapter 8: [“Test Access Module \(TAM\)”](#).

Console Access

Use console access to configure the interface for each device port, to monitor the network, to build connections, and to perform diagnostics. Console access is password protected. Telnet is supported as well as direct connection to the asynchronous port.

The supervisor console can be reached through the asynchronous port on the AS4000 System Manager interface module, or a modem call to the console port. Once the TCP/IP parameters are configured, Telnet access via the LAN also provides connection to the supervisor console.

1. On the rear of the shelf, locate the AS4000 Manager Interface. Locate the RJ-11 connector labeled TERM. Attach your terminal to this connector.
2. Configure your terminal communications parameters as follows:
 - Data Rate: 19,200 bit/s (lower rates will also work)
 - Data Bits: 8
 - Stop Bits: 1
 - Parity: None
 - Flow Control: None

Logging into the AS4000

Press ENTER on your terminal keyboard to activate automatic baud rate recognition (ABR). A login prompt appears, followed by a password prompt. Enter your login name and password.

NOTE: The default is no user name and nopassword. Press the ENTER key twice to log in for the first time.

If the **Terminal Selection Menu** (Figure 4-1) appears, the AS4000 System Manager did not automatically detect your terminal type. For many terminal emulation programs the best selection for terminal type is VT-100. When you select your terminal type from the list, the **Main Menu** appears (Figure 4-4).

Figure 4-1 Terminal Selection Menu

```

WELCOME. . .
Sun, Jan 01, 1999 00:00:28am
Software 2.00A, Hardware 00s: 2.1

Terminal types supported:

(1) ADDS Regent 25          (11) Hazel ti ne 1500
(2) ADDS Vi ewpoi nt       (12) I BM 3101
(3) Atti s 4410/4425       (13) I CL 6401
(4) Data General DASHER   (14) LSI ADM 11/31
(5) Datamedi a 1521       (15) Paradyne 7811
(6) Datamedi a EXCEL 30   (16) Qume QVT-101/102/108
(7) Datamedi a EXCEL 42   (17) Tel etype 5410/5425
(8) DEC VT-52             (18) Tel evi deo 900
(9) DEC VT-100/131/220    (19) Wyse WY-50
(10) Freedom 100          (20) Wyse WY-75

Enter your terminal type [1..20]...
```

Navigation Keys

Most menus have action keys located at the bottom of each screen. To move forward in the screen fields press the SPACEBAR or DOWN ARROW key. To move backward through the menu selections press BACKSPACE or UP ARROW. To change parameters press ENTER. To save changes and exit a screen press X. To abort all changes and exit a screen press ESC.

To select a parameter on any screen, position the cursor on the entry and press ENTER. Some fields contain pre-defined parameters, these will scroll through a range of selectable values. Press ENTER to scroll forward through the options. Press B to scroll backward through the options. When the desired value is shown, use "X" to exit the menu or use a cursor arrow key to move to another field.

Other fields require you to enter information, these will present a field with underscore characters after you press ENTER. The SPACEBAR and BACKSPACE, or DOWN and UP ARROW keys move the cursor to different fields on the screen.

Press "X" and the system queries you to update your configuration. Press "Y" to save the changes and "N", to abort your changes. Both options return to the previous menu.

Press ESC from a menu and the system queries you to abort the configuration. Press "Y" and the system aborts all changes, returning you to the previous menu. Press "N" and the system aborts any changes, remaining at the current display.

Help and Menu Procedures

For help maneuvering around in the menus, press the ? key to access the **Help** screen.

NOTE: Values that are entered or selected on the configuration screens are not processed until you exit the screen. Diagnostic parameters are activated immediately.

Figure 4-2 Help Menu

```

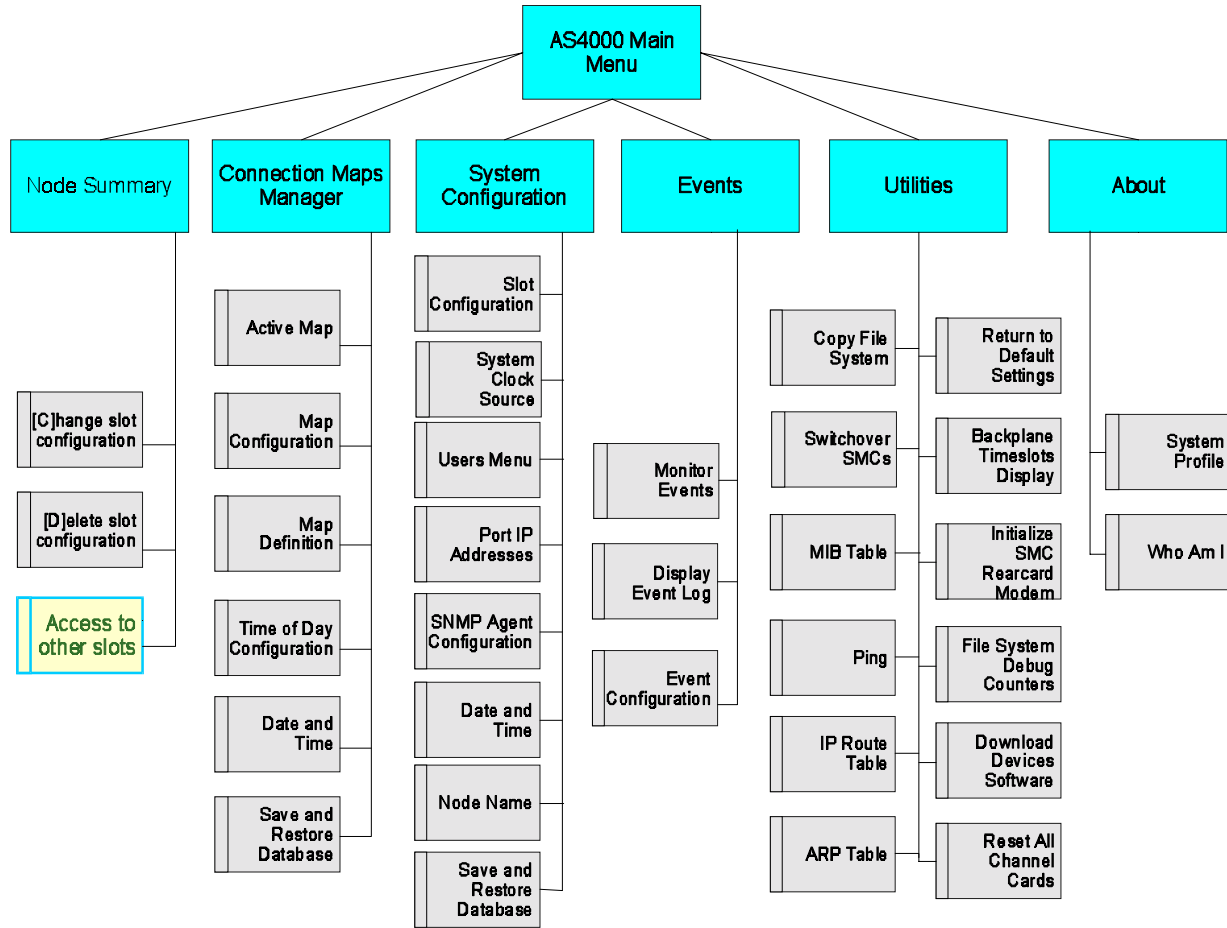
*****
*                                     *
*               - HELP <?> -         *
*                                     *
* To select any menu or field on any screen, position the cursor *
* on the entry and press <RETURN>.  *
*                                     *
* CURSOR MOVEMENT *
*   Move forward   = <SPACE> / <Down Arrow> *
*   Move backward  = <BACKSPACE> / <Up Arrow> *
*                                     *
* FIELD CHANGE *
*   Options field: Scroll forward = <RETURN> *
*                  Scroll backward = <B> *
*                                     *
*   Text field:   Update entry    = <RETURN> *
*                  Recall last entry = <ESC> *
*                                     *
* SCREEN EXIT *
*   Save any changes = <X> *
*   Abort all changes = <ESC> *
*                                     *
*               - Press any key to exit - *
*                                     *
*****

```

System Menu Tree

The AS4000 uses a hierarchical menu tree. [Figure 4-3](#) illustrates the first two levels of menu access beneath the **Main Menu**.

Figure 4-3 AS4000 System Menu Tree

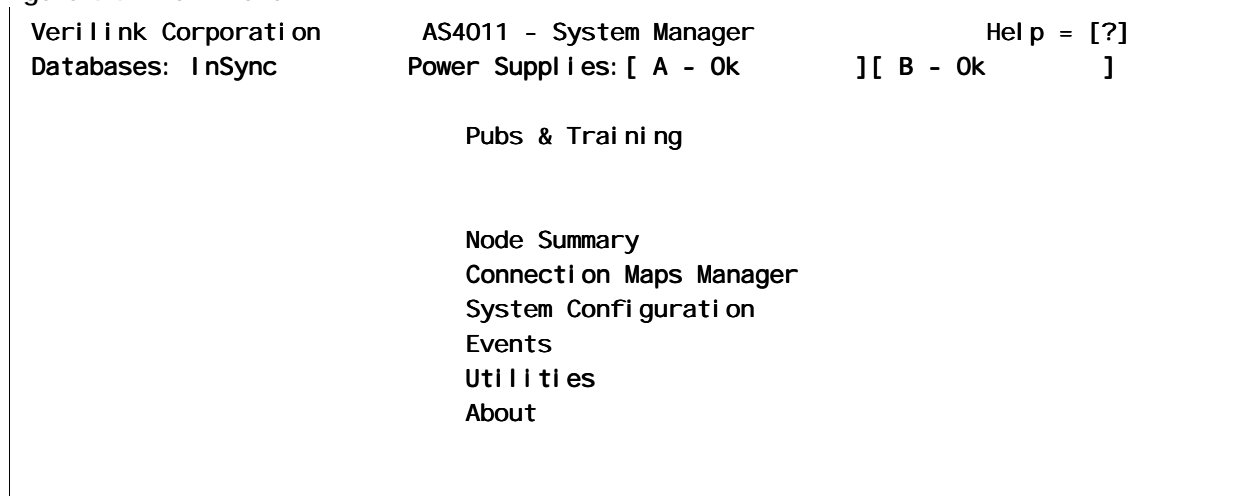


Main Menu

The **Main Menu** is the top-level menu for the AS4000.

This menu provides access to the [Node Summary Menu](#), [Connections Map Manager Menu](#), [System Configuration Menu](#), [Events Menu](#), [Utilities Menu](#), and [About Menu](#). The **Main Menu** is illustrated in (Figure 4-4).

Figure 4-4 Main Menu



Other Modules

To access the application modules from the **Main Menu**, select the **Node Summary Menu**. A list of configured application modules will appear. If the module you wish to access is currently installed in the shelf, select the module by pressing the SPACE BAR. Then press ENTER to access the selected module.

Node Summary Menu

The **Node Summary Menu** structure provides access to any modules physically located within the AS4000 system. This menu displays the following:

- The type of module that has been defined for each slot
- Module shelf location (slot)
- Status of each module in the shelf, including the System Manager modules

Use this menu to change or delete slot configurations, or to configure an application module. From the application-specific submenus ([Figure 4-5](#)) you can view and change all application parameters.

Figure 4-5 Node Summary Menu

Verilink Corporation		AS4011 - System Manager		Hel p = [?]
Databases: InSync				
Node Summary Menu				
Sl ot#	Confi gured Type	Actual Type	Status	
-----	-----	-----	-----	
01)	T3	T3	OK	
02)	Quad HI gh Speed	Quad HI gh Speed	OK	
03)	----	----	Not Present	
04)	----	----	Not Present	
05)	Quad T-1	Quad T-1	OK *	
06)	Quad T-1	Quad T-1	OK *	
07)	Quad T-1	Quad T-1	OK	
08)	Quad T-1	Quad T-1	OK	
09)	----	----	Not Present	

To access the configuration menus for a particular module, position the cursor on that slot and press ENTER. The individual main menu for the selected module appears (if that module is present in the slot).

Connections Map Manager Menu

The **Connection Maps Manager Menu** provides access to six submenus, as shown in [Figure 4-6](#). From this menu, you can define, configure and activate all parameters pertaining to the AS4000 connection maps.

NOTE: *Values that are entered or selected on the configuration screens are not processed until you exit the screen. Diagnostic parameters are activated immediately.*

Figure 4-6 Connection Maps Manager Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
Active Map: Map 01		
Connection Maps Manager Menu		
Active Map		
Map Configuration		
Map Definition		
Time of Day Configuration		
Date and Time		
Save and Restore Database		

Active Map Menu

Use the **Active Map Menu** to add or delete a connection.

Figure 4-7 Active Maps Menu

Verilink Corporation

AS4011 - System Manager

Help = [?]

Map Configuration: Map 01

Note: You must exit this menu in order to update the switch map

Name	Src	Dest	Speed	Type	Active	Test	Tester	Port

Branch5 to DS3	01.01.01	08.01.01	1536k	D	FDX			
DS3 to Router1	01.02.01	02.01.01	1536k	D	FDX			
--								
--								
--								
--								
--								
--								
--								
--								
--								
--								
--								

Connection Filter: Not Active

[F]ilter

[T]est set up/[R]estore

[A]dd/[L]isten/[D]elete connection

[H]ome/[E]nd/[N]ext/[P]rev page

Add or Delete Connection To add or delete a connection, position the cursor on a name field and press A to add or D to delete.

Add New Connection If you are adding a connection, the **Add New Connection** screen appears (see [Figure 4-8](#)).

Figure 4-8 Add New Connection Menu

VeriLink Corporation	AS4011 - System Manager	Help = [?]
Add New Connection Screen		
<div style="display: flex; justify-content: space-between;"> <div> <p>Connection name:</p> <p>Src slot.....:</p> <p>Src port.....: 01</p> <p>Starting Src Ts: 01</p> <p>Speed.....: 56K (1 DS0)</p> <p>Ts Allocation : Auto-Consecutive</p> </div> <div> <p>Type.....: Full-Duplex</p> <p>Dest slot.....:</p> <p>Dest port.....: 01</p> <p>Starting Dest Ts: 01</p> <p>Voice/Data.....: Data</p> </div> </div>		
[Save connection]		

The commands used to add a new connection are listed in [Table 4-1](#).

Table 4-1 Add New Connection Commands

Connection Name	Enter a name for the connection you are configuring. Any name up to 19 characters in length can be entered.
Type	Select one of three types of connections: <ul style="list-style-type: none"> • Full-Duplex —In full-duplex connections, data flows in two directions. • Broadcast Connection—Broadcast connections declare a source and destination. Data flows from the source to the destination. • Broadcast Master—Broadcast Master transmits only; there is no destination.
Source Slot and Port	Select the source slot and source port for the connection. The port always defaults to 01. You can allocate the slot number.
Starting Source Timeslot	Select the starting source timeslot number (DS0) for automatic timeslot allocation.
Speed	This field toggles through a range of possible values based on the number of timeslots assigned to the connection, and the bandwidth per DS0 (56kbit/s or 64kbits/s). See Table 4-2 .
Destination Slot and Port	Select the destination slot and destination port for the connection. The port always defaults to 01. You can allocate the slot number.
Starting Destination Timeslot	Select the starting destination timeslot number (DS0) for automatic timeslot allocation.
Voice/Data	Select the type of traffic being connected (either voice or data).

Timeslot Allocation	<p>This field is used to determine how the timeslots will be allocated. The choices are Auto-Consecutive, Alternate and Manual.</p> <p>With "Auto-Consecutive" selected, the AS4000 automatically allocates timeslots in consecutive order, beginning with the starting source and destination timeslot.</p> <p>With "Alternate" selected, the AS4000 allocates timeslots alternately, beginning with the starting source/destination timeslot.</p> <p>With "Manual" selected, there is no automatic allocation of timeslots.</p>
----------------------------	---

CAUTION

In some cases, the same data rate can be achieved with two different DSO quantities, one with 56 kbit/s DSOs and the other with 64 kbit/s DSOs. Refer to [Table 4-2](#).

Table 4-2 Speed Options

Total Bandwidth (Kbit/s)	Bandwidth per DSO (Kbit/s)	Number of DSOs
48 kbit/s	subrate	1 DSO
56	56	1
64	64	1
112	56	2
128	64	2
168	56	3
192	64	3
224	256	4
256	64	4
280	56	5
320	64	5
336	56	6
384	64	6
392	56	7
448	64	7
448	56	8
504	56	9
512	64	8
560	56	10
576	64	9
616	56	11

640	64	10
672	56	12
704	64	11
728	56	13
768	64	12
784	56	14
832	64	13
840	56	15
896	56	16
952	568	17
960	64	15
1008	56	18
1024	64	16
1152	64	18
1064	56	19
1088	64	17
1120	56	20
1176	56	21
1216	64	19
1232	56	22
1280	64	20
1288	56	23
1344	56	24
1344	64	21
1408	64	22
1472	64	23
1536	64	24

Connection Filter Configuration

You can arrange to view specific data by using the **Filter Menu**. The menu options are:

- None - no filtering (default)
- Filter by connection name
- Filter by slot

- Filter by slot/port
- Starting slot/port/timeslot

Figure 4-9 Connection Filter Configuration Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
<p style="text-align: center;">Connection Filter Configuration</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">Filter Id.....: None</p> <p style="text-align: center;">Connection Name..:</p> <p style="text-align: center;">Slot Number.....: 0</p> <p style="text-align: center;">Port Number.....: 0</p> <p style="text-align: center;">Timeslot Number...: 0</p>		

Table 4-3 Connection Filter Configuration Menu

Connection Name	This field represents the 19-character connection name given by the user on the Add New Connection screen.
Slot Number	This field represents the source slot of a connection as entered on the Add New Connection screen.
Port Number	This field represents the port of a connection, as entered on the Add New Connection screen. This would be a specific T1 in the aggregate of a T3 module, or a physical port in the case of other types of modules.
Timeslot Number	This field allows selection of a connection based on the DS0s used.

Change Connection Menu

This menu is used to re-assign timeslots and change speed. This screen is accessed from the **Active Map Menu** by positioning the cursor on a particular Name field and pressing ENTER. All other parameters are read-only.

Figure 4-10 Change Connection Screen

Verilink Corporation		AS4011 - System Manager		Help = [?]	
Change Connection screen					
Connection name: Branch5 to DS3			Type.....: Full-Duplex		
Src slot.port : 01.01 T3			Dest slot.port: 08.01 Quad T-1		
Speed.....: 1536K/64 (24 DS0s)			Data/Voice....: Data		

Src Port Time slot assignments			Dest Port Time slot assignments		
01 Branch5	12 Branch5	23 Branch5	01 Branch5	12 Branch5	23 Branch5
02 Branch5	13 Branch5	24 Branch5	02 Branch5	13 Branch5	24 Branch5
03 Branch5	14 Branch5		03 Branch5	14 Branch5	
04 Branch5	15 Branch5		04 Branch5	15 Branch5	
05 Branch5	16 Branch5		05 Branch5	16 Branch5	
06 Branch5	17 Branch5		06 Branch5	17 Branch5	
07 Branch5	18 Branch5		07 Branch5	18 Branch5	
08 Branch5	19 Branch5		08 Branch5	19 Branch5	
09 Branch5	20 Branch5		09 Branch5	20 Branch5	
10 Branch5	21 Branch5		10 Branch5	21 Branch5	
11 Branch5	22 Branch5		11 Branch5	22 Branch5	
[V]iew all connections			[C]lear connection timeslots		

Test A Connection Menu

This menu is used to select a test type and to define the address (slot and port) where the test will be run. All other parameters are read-only.

The "Test ID" field is used to select one of four possible tests:

- Monitor- Source
- Monitor - Destination
- Split - Source
- Split- Destination

This screen is accessed from the **Active Map Menu** by positioning the cursor on a particular "name" field and pressing T.

Figure 4-11 Test Connections Screen

Verilink Corporation		AS4011 - System Manager		Help = [?]	
**** Test Connection screen ****					
Connection name: Branch5 to DS3			Type.....: Full-Duplex		
Src slot.port : 01.01 T3			Dest slot.port: 08.01 Quad T-1		
Speed.....: 1536K/64 (24 DS0s)			Data/Voice....: Data		
===== Test id.: None			TESTER slot.port: .		
Src Port Time slot assignments			Dest Port Time slot assignments		
01 Branch5	12 Branch5	23 Branch5	01 Branch5	12 Branch5	23 Branch5
02 Branch5	13 Branch5	24 Branch5	02 Branch5	13 Branch5	24 Branch5
03 Branch5	14 Branch5		03 Branch5	14 Branch5	
04 Branch5	15 Branch5		04 Branch5	15 Branch5	
05 Branch5	16 Branch5		05 Branch5	16 Branch5	
06 Branch5	17 Branch5		06 Branch5	17 Branch5	
07 Branch5	18 Branch5		07 Branch5	18 Branch5	
08 Branch5	19 Branch5		08 Branch5	19 Branch5	
09 Branch5	20 Branch5		09 Branch5	20 Branch5	
10 Branch5	21 Branch5		10 Branch5	21 Branch5	
11 Branch5	22 Branch5		11 Branch5	22 Branch5	

The Tester slot.port field is used to define the address (slot and port) where the test will be run. The tester address is written as a four-digit number separated by a decimal point (for example, 01.02), where the first two digits represent the slot number and the last two digits represent the port number.

Configuration Map Menu

This menu is used to select a map for configuration. You can annotate, copy, or activate maps from this menu. It is not used to assign map names or map descriptions (this is done on the **Map Definition Menu**).

Figure 4-12 Configuration Maps Menu

VeriLink Corporation		AS4011 - System Manager		Help = [?]
Configuration Maps Menu				
No.	Name	Description	Status	
---	-----	-----	-----	
01	Map 01	Map 01 description	Active	
02	Map 02	Map 02 description		
03	Map 03	Map 03 description		
04	Map 04	Map 04 description		
05	Map 05	Map 05 description		
[A]ctivate map [T]ag map for copy [C]opy to all tagged maps				

Up to five maps can be configured, but only one map can be active at a time. The status is “Active”, “Loaded” or “Configured”. A map not being used will show no status. To copy a map, tag the “destination” map, then copy from the source map. For example to copy Map 4 to Map 3:

1. Position the cursor to Map 3 and press T to tag.
2. Position the cursor to Map 4 and press C to copy.
3. Respond to the confirmation prompt by pressing Y for yes or N for no.

NOTE: You cannot copy a map into an active map.

Map Definition Menu

This screen is used to assign a name and description to each of the five connection maps. The Status field is read-only.

Figure 4-13 Map Definition Menu

VeriLink Corporation		AS4011 - System Manager		Help = [?]
Configuration Maps Menu				
No.	Name	Description	Status	
---	-----	-----	-----	
01	_____	Map 01 description	Active	
02	Map 02	Map 02 description		
03	Map 03	Map 03 description		
04	Map 04	Map 04 description		
05	Map 05	Map 05 description		

In the example **Map Definition Menu** shown above, the user has pressed the ENTER key in the field located to the right of 01 and underneath Name. This begins the process of setting map names and descriptions.

Time and Day Configuration Menu

The day, date, and time displayed at the top of this menu should reflect the current day, date, and time. If not, go to the **Date and Time Menu** and correct it first. Otherwise, the maps can be activated at the wrong times.

Figure 4-14 Time and Day Configuration Menu

Verilink Corporation		AS4011 - System Manager		Help = [?]		
		Wednesday , March		17 08:11		
Time Of Day Configuration Manager		Enabled: No		ActiveMap: Map 01		
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...

The Active Map field is a read-only field. It shows which map is currently active.

The Enabled field appears if the time of day configuration feature has been enabled. If yes, the connection maps are activated at the pre-set times. If no, the map does not change.

Setting a schedule for each day requires the following guidelines:

- Each map is divided into seven days.
- Each day is divided into a cell, requiring three entries for each cell: hours, minutes and map name. The hours and minutes must be entered in a twenty-four hour format. For example, 5:00 pm would be shown as "1700" hours.
- If the Time of Day option is enabled, the new configuration takes effect as soon as the configuration process is finished.

Configuring the Date and Time Menu

The **Date and Time Menu** can also be accessed by selecting date and time from the **System Configuration Menu**. The date and time is only set once; it is accessible from both screens.

Figure 4-15 Date and Time Menu

VeriLink Corporation	AS4011 - System Manager	Help = [?]
Date and Time Menu		
Month.....: March Day.....: 17 Year.....: 1999 Hour.....: 8 Minute....: 17 Second....: 19 Day.....: Wednesday		

The **Set Time Menu** has seven parameters: month, day, year, hour, minute, second, and day. Press ENTER to scroll forward, or press the B key to scroll backward through the options. Press the SPACE BAR or BACKSPACE key to move from one parameter to the next. The options are defined as follows:

- Month options are January through December
- Day options are 1 through 31
- Hour options are 1-24
- Minute and second options are 0 through 59
- Day options are Sunday through Saturday
- Year default is 1999.

NOTE: Date and time functions in the AS4000 are Y2K compliant.

Save and Restore Database Menu

This menu is used to save or restore the database.

The Host IP Address field is used to specify the remote host's IP address. IP addresses are written as four fields of one to three digits each separated by a period. Each field represents 8 bits of the address. The range of each field is from 0-255.

Enter an IP address in dotted decimal form. If you do not know the remote host's IP address, consult your network administrator.

The Host Directory field is used to specify the directory on the remote host where the AS4000's files are to be saved. Up to eight characters can be entered in this field.

Figure 4-16 Save and Restore Database Menu

```
VeriLink Corporation          AS4011 - System Manager          Help = [?]
```

Save and Restore Database Menu

Host IP address.: 192.94.45.229
Host directory.: C:\as4Ksave
Host file name.: dnxconf

[S]ave Database [R]estore Database

NOTE: This parameter can be accessed from both the **System Configuration** and **Connection Maps Manager** menus. It need only be configured once.

Host File Name

The host file name is the default name. Change this name if you are going to save database files for more than one AS4000 site to the host. When you restore file names, the file name will have a .b file extension. Up to eight characters can be entered in this field.

To save and restore the AS400's configuration:

1. Create a directory on the host computer. Because the configuration consists of several files, a separate directory is required for each AS4000.
2. Run the host's TFTP server.

When you choose the Save Remote Configuration command, all file names that exist on the AS4000 are compressed into one file which is then sent to the host. To save the configuration:

1. Choose the **Connections Map Manager Menu**, then the **Save/Restore Remote Configuration Menu**.
2. Enter the remote host's IP address and directory on the host where this AS4000's files are to be saved.

3. Select “Save” and exit the menu.
4. Press Y at the confirmation screen.

The “Restore” command gathers the files previously backed up on the host computer and sends them back to the AS4000 node. To restore the configuration:

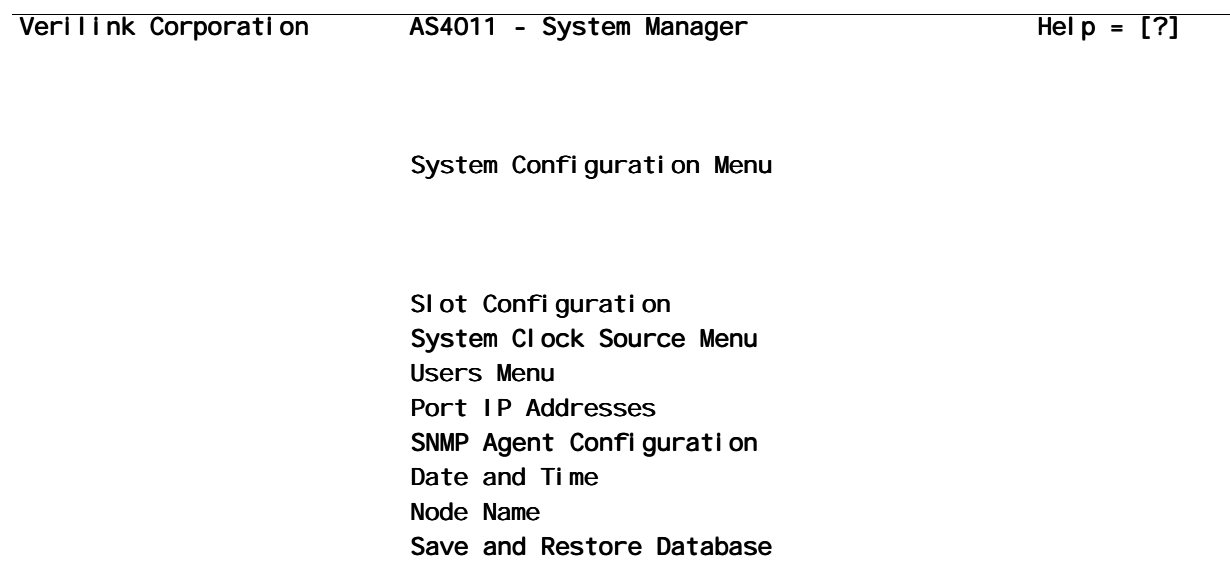
1. Choose the **Connection Maps Manager Menu**, then the **Save/Restore Remote Configuration Menu**.
2. The remote host’s IP address and directory where this AS4000’s configuration was saved appears. If incorrect, enter the correct information.
3. Select “Restore” then exit the menu.
4. Press Y at the confirmation prompt. When the file transfer is complete, the system re-initializes with the restored configuration.

NOTE: The *DEFAULT HOST FILE NAME* is *AS4000conf*. Change this name if you plan to save more than one AS4000 to the host. Restored file names have a *.b* file extension.

System Configuration Menu

The **System Configuration Menu** ([Figure 4-17](#)) provides access to submenus for configuring slots, the source clock, port IP addresses, SNMP agent and such database management tasks as setting the time, date, node name and password, and saving/restoring a configuration to/from a remote host.

Figure 4-17 System Configuration Menu



Some of the links on the **System Configuration Menu** are duplicated on other AS4000 menus.

Because this function can be accessed from several paths, the [Save and Restore Database Menu](#) is covered in a previous section of this chapter.

Slot Configuration

The **Slot Configuration Menu** is used to configure and view which types of front and rear modules are in the slots of the AS4000 shelf. It also allows application of a mnemonic label.

Figure 4-18 Slot Configuration Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
Slot Configuration Menu		
Slot#	Card Type	Slot Name
-----	-----	-----
1	T3	DS3 to NYC
2	Quad High Speed	Routers
3	----	
4	----	
5	Quad T-1	PBX 7 & 8
6	Quad T-1	Frame Relay
7	Quad T-1	Campus 2
8	Quad T-1	Branch ATMs
9	----	
10	----	
11	Test Access	
Change Card = [Enter key] [D]elete Card		

Use this menu to configure which types of modules are present in the AS4000. The Card Type field will toggle through a list of available modules. The Slot Name field accepts entry of an alphanumeric label for the module. The Slot Name may be up to eleven characters long.

System Clock Source Menu

The **System Clock Source Menu** is used to configure the AS4000 so that it uses a common clock source for all modules and connections. This synchronizes the TDM (Time Division Multiplexer) functions of the backplane. Two alternate clock sources can be configured.

If the mode is set to Primary, Secondary or Tertiary, then only that clock source will be used. If the mode is set to automatic, then the AS4000 System Manager will choose the highest priority clock source that is currently available. If any clock source fails and no other is available, the system defaults to free run, which is an internal clock source.

Figure 4-19 System Clock Source Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
System Clock Source Menu		
Mode.....: Primary		
Primary....: 01 - DS3 to NYC	Port: 01	
Secondary...: 06 - Frame Relay	Port: 01	
Tertiary...: 08 - Branch ATMs	Port: 03	
Current Clock Source		

Freerun	Port: NA	

In the example menu shown above, the primary clock source is the DS3 module in slot 1 of the shelf. It is currently free-running, as indicated on the bottom line.

Users Menu

The **Users Menu** allows the configuration of user names, passwords and access levels. In the example menu shown in [Figure 4-20](#), the user Steve has Administrative rights—the highest access level, and is currently connected.

Users with an access level of Provision may make configuration changes, run diagnostic tests, and do everything else that the administrator can do except add/delete users or change passwords.

Users with View Only access can do just that, view settings, options and alarm information but change nothing. In this example the administrator has made certain that persons using the account named Executives can do no harm.

Users with Test access, like the user named Maintenance in this example, can do tests but may not change configurations.

There can be multiple users with the same access level, even more than one Administrator account.

The ID number is an arbitrary two-digit numeric value created when a user is added. It is used in the event logs to track user activity.

Figure 4-20 Users Menu

Verilink Corporation				AS4011 - System Manager				Help = [?]			
Users Profile Manager											
Name	Id	Ri ghts	Status	Name	Id	Ri ghts	Status				
-----								-----			
Steve	01	Admi n	Logged I n								
Net Ops	02	Provi si on									
Executi ves	03	VI ew Onl y									
Mai ntenance	05	Test									
[A]dd user				[D]el ete user							

Port IP Addresses

The **IP Addresses Menu** is used to configure the TCP/IP stack in the AS4000 and control how it behaves on your 10BaseT LAN segment. These options only affect the 10BaseT port's operation, they are not directly related to the flow of user data through the AS4000.

Figure 4-21 IP Addresses Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
Port Configuration Menu		
<p>IP encapsulation.....: Ethernet II</p> <p>LAN IP address.....: 208.150.145.141</p> <p>LAN IP mask.....: 255.255.255.0</p> <p>Enable RIP.....: No</p> <p>Default gateway (if RIP disabled): 208.150.145.1</p> <p>Backplane IP address.....: 200.0.0.0</p> <p>Backplane IP mask.....: 255.255.255.0</p> <p>Backplane IP Address Management</p> <p>-----</p> <p>Backplane IP translation.....: No</p> <p>Configure slot's IP table</p>		

Table 4-4 Port IP Addresses

Screen Element	Usage/Definition
IP encapsulation	If your LAN is using standard TCP/IP you should select Ethernet II for the encapsulation type. 802.3 encapsulation is used most often on LANs running Novell Netware. Your selection must match the other hardware on the same LAN segment.
LAN IP address	The TCP/IP address for this AS4000 shelf. Consult your network administrator to obtain a valid IP address for your LAN.
LAN IP mask	A standard Ethernet subnet mask, the example shown reflects standard class C address masking in which the first three octets of the address above (208.150.145) define the network address and the last octet (141) defines the specific device.
Enable RIP	<p>If the AS4000 will always use the same IP address (router interface) to reach other segments you should leave RIP off and manually configure the router (gateway) information.</p> <p>Enable RIP (Routing Information Protocol—a subset of TCP/IP) only if you want the AS4000 to discover the devices available on the local LAN segment. RIP uses System Manager resources which might otherwise be used to manage the AS4000 node. Consider leaving RIP off and manually configuring a gateway address, especially in a high-traffic LAN environment.</p>
Default gateway	This is the IP address of the router or switch that this AS4000 should send packets to if their destination is on another LAN segment.

Screen Element	Usage/Definition
Backplane IP address	This field represents a base IP address which the System Control module uses to calculate internal IP addresses for the other slots in the shelf. These addresses are only meaningful or visible inside the AS4000. Verilink recommends you do not change this field unless advised to do so by Verilink Tech Support.
Backplane IP mask	This field represents a subnet mask which the System Control module uses to calculate internal IP addresses for the other slots in the shelf. Verilink recommends you do not change this field unless advised to do so by Verilink Tech Support.
Backplane IP translation	This feature is used by the SMC to create internal-only IP addresses for each module. Verilink recommends this feature be left set to No.
Configure slot's IP table	This table can be used to configure individual IP addresses for each module. If this is done, you must Telnet to each module individually. You cannot select another module from the current module if Backplane IP Translation is enabled.

SNMP Agent Configuration

The **SNMP Agent Configuration Menu** is used to configure the AS4000 to work with an SNMP (Simple Network Management Protocol) management program running on one or more computers anywhere in the network. The options are explained in [Table 4-5](#).

Figure 4-22 SNMP Configuration Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
SNMP Agent Configuration Menu		
System Group Parameters		

System domain name....:	Tech Pubs & Training	
System description....:	Verilink Corporation	AS4011 - System Manager
System location.....:	San Jose, CA	
System contact.....:	Dave Jackson	
Trap Controls		

Traps.....:	Enabled	
Authentication traps..:	Enabled	
Client-manager IP Addresses		Community Profiles
-----		-----
(used for trap destinations)		Read-only:
192. 94. 45. 229	0. 0. 0. 0	private
192. 94. 45. 101	0. 0. 0. 0	public
0. 0. 0. 0	0. 0. 0. 0	public
0. 0. 0. 0	0. 0. 0. 0	public
		Read-write:
		private
		private
		private
		private

Table 4-5 SNMP Configuration Commands

Screen Element	Usage/Definition
System domain name	Configurable field used to enter a name, up to 22 characters long, for this site. This information will be included in alarm messages (traps) sent to the SNMP host.
System description	Informational field which presents manufacturer and version information used by the SNMP host to reference the correct MIB (Management Information Base).
System location	Configurable field, up to 19 characters long. Usually used to represent city or other location information.
System contact	Configurable field, the name of a person to be contacted at the AS4000 site during system outages or for other service related issues.
Traps	Used to toggle on/off the sending of alarm messages to an SNMP manager.
Authentication traps	Used to toggle on/off the requirement for authentication from the SNMP manager.
Client-manager IP Addresses	Also known as Trap Host IP addresses, these fields allow the configuration of up to four addresses for computers running SNMP management programs. The System Control module will send trap messages to each of these computers.
Community Profiles	Also known as read/write community strings, these are passwords that the System Control module and the SNMP manager agree upon to verify the authenticity of SNMP Get, Set and Trap messages. The values configured in the AS4000 must match those used by the SNMP manager(s).

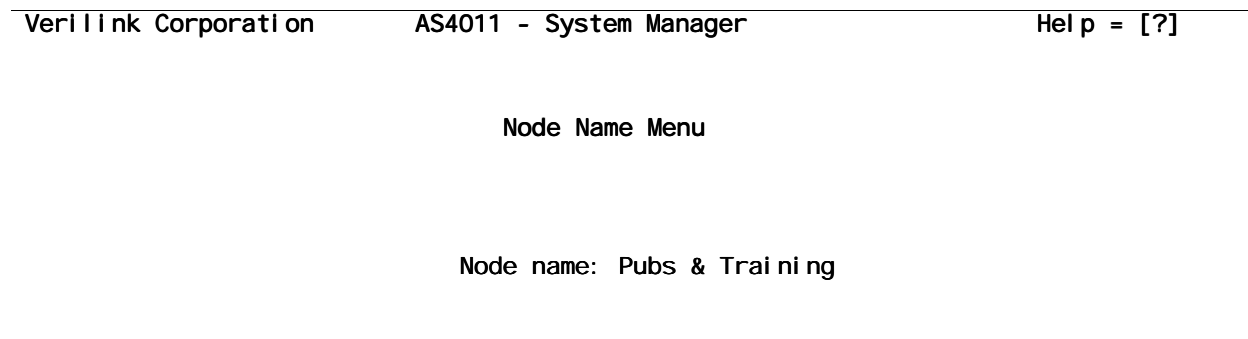
Date and Time Use the **Date and Time Menu** to set the system clock in the AS4000.

Figure 4-23 Date and Time Menu

Verilink Corporation	AS4011 - System Manager	Help = [?]
Date and Time Menu		
Month.: March		
Day.: 18		
Year.: 1999		
Hour.: 14		
Minute.: 18		
Second.: 45		
Day.: Thursday		

Node Name The **Node Name Menu** allows entry of an alpha-numeric label for the AS4000 node. The field may be up to 17 characters.

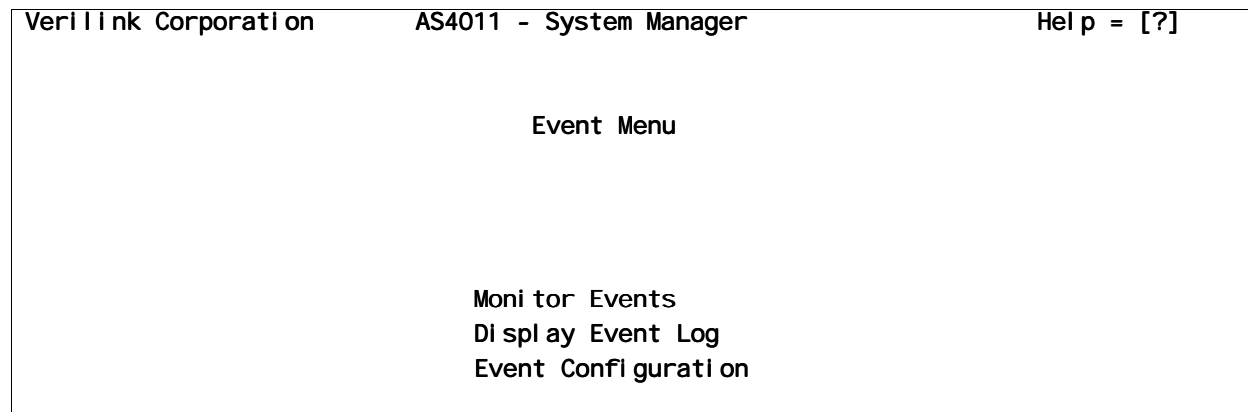
Figure 4-24 Node Name Menu



Events Menu

Use the **Events Menu** to monitor and display system events. This menu provides access to three submenus. From these menus you can monitor system events, display the event log or configure events.

Figure 4-25 Events Menu



The AS4000 constantly monitors for the occurrence of “events” such as alarms, test commands, and system resets. When an event occurs, it is given a sequence number and a time and date stamp. The slot number and a description of the event is also recorded.

Monitor Events Menu

Select the **Monitor Events Menu** ([Figure 4-26](#)) to see a running log of the events, as they take place. You can also clear the event log from the System Events display.

Figure 4-26 Monitor Events Display

Verilink Corporation			AS4011 - System Manager		Help = [?]
System Events					
Seq	Time	Date	Slot	Event	
---	----	----	----	-----	
0143	09:51	03/17	SMCA	FSYS - complete copy 'rhostdnx' to the offline SMC	
0142	09:51	03/17	SMCA	FSYS - start copy 'rhostdnx' to the offline SMC	
0141	08:37	03/17	SMCA	TFTP timeout to 192.94.45.229 dnxconf.b	
0140	08:05	03/17	SMCA	LOGIN user - Steve (login total: 1)	
0139	08:03	03/17	SMCA	LOGOUT user - Steve (login remains: 0)	
0138	07:55	03/17	SMCA	FSYS - SMC-A & SMC-B files are in sync	
0137	07:54	03/17	SMCA	FSYS - SMC-A & SMC-B files are not in sync	
0136	07:54	03/17	SMCA	FSYS - complete copy '01.con' to the offline SMC	
0135	07:54	03/17	SMCA	FSYS - start copy '01.con' to the offline SMC	
0134	07:53	03/17	SMCA	FSYS - complete copy '01.bts' to the offline SMC	
0133	07:53	03/17	SMCA	FSYS - start copy '01.bts' to the offline SMC	
0132	07:52	03/17	SMCA	FSYS - complete copy 'cfgmaps' to the offline SMC	
0131	07:52	03/17	SMCA	FSYS - start copy 'cfgmaps' to the offline SMC	
0130	07:47	03/17	SMCA	LOGIN user - Steve (login total: 1)	
0129	07:23	03/17	SMCA	LOGOUT user - Steve (login remains: 0)	
[C] Clear event log				>> indicates Audit Trail Event	

Display Event Log

Select **Display Event Log** ([Figure 4-27](#)) to view the most recent events, up to the moment of your request. It will not add additional events that may occur as you view the log. You cannot clear the log from this display.

Figure 4-27 Display Event Log Screen

Seq	Time	Date	Slot	Event
---	----	----	----	-----
0145	13: 47	03/17	SMCA	LOGIN user - Steve (login total: 1)
0144	12: 24	03/17	SMCA	LOGOUT user - Steve (login remains: 0)
0143	09: 51	03/17	SMCA	FSYS - complete copy 'rhostdnx' to the offline SMC
0142	09: 51	03/17	SMCA	FSYS - start copy 'rhostdnx' to the offline SMC
0141	08: 37	03/17	SMCA	TFTP timeout to 192.94.45.229 dnxconf.b
0140	08: 05	03/17	SMCA	LOGIN user - Steve (login total: 1)
0139	08: 03	03/17	SMCA	LOGOUT user - Steve (login remains: 0)
0138	07: 55	03/17	SMCA	FSYS - SMC-A & SMC-B files are in sync
0137	07: 54	03/17	SMCA	FSYS - SMC-A & SMC-B files are not in sync
0136	07: 54	03/17	SMCA	FSYS - complete copy '01.con' to the offline SMC
0135	07: 54	03/17	SMCA	FSYS - start copy '01.con' to the offline SMC
0134	07: 53	03/17	SMCA	FSYS - complete copy '01.bts' to the offline SMC
0133	07: 53	03/17	SMCA	FSYS - start copy '01.bts' to the offline SMC
0132	07: 52	03/17	SMCA	FSYS - complete copy 'cfgmaps' to the offline SMC
0131	07: 52	03/17	SMCA	FSYS - start copy 'cfgmaps' to the offline SMC
0130	07: 47	03/17	SMCA	LOGIN user - Steve (login total: 1)
0129	07: 23	03/17	SMCA	LOGOUT user - Steve (login remains: 0)
0128	07: 13	03/17	SMCA	LOGIN user - Steve (login total: 1)
0127	07: 12	03/17	SMCA	LOGOUT user - Steve (login remains: 0)
0126	07: 11	03/17	SMCA	LOGIN user - Steve (login total: 1)
Press any key to continue...				

Event Configuration Menu

Select **Event Configuration Menu** (Figure 4-28), to transmit the AS4000's event log to a computer.

Log events to syslog - select Yes or No to send the event data to a host PC.

Syslog server IP Address - the host address where you want to send the event data.

Identifier - identifies the specific AS4000 unit.

NOTE: Start the SysLog program on your UNIX, SunOS or LINUX host to use this function.

Figure 4-28 Event Configuration Menu

VeriLink Corporation	AS4011 - System Manager	Help = [?]
Event Configuration Menu		
Log events to syslog....: No Syslog server IP address: 0.0.0.0 Identifier.....:		

Utilities Menu

Use the **Utilities Menu** to access system routing utilities, copy system files, download software, return to default settings, and view backplane timeslots. Use the **Utilities Menu** only with caution or with the assistance of Verilink's Technical Assistance Center.

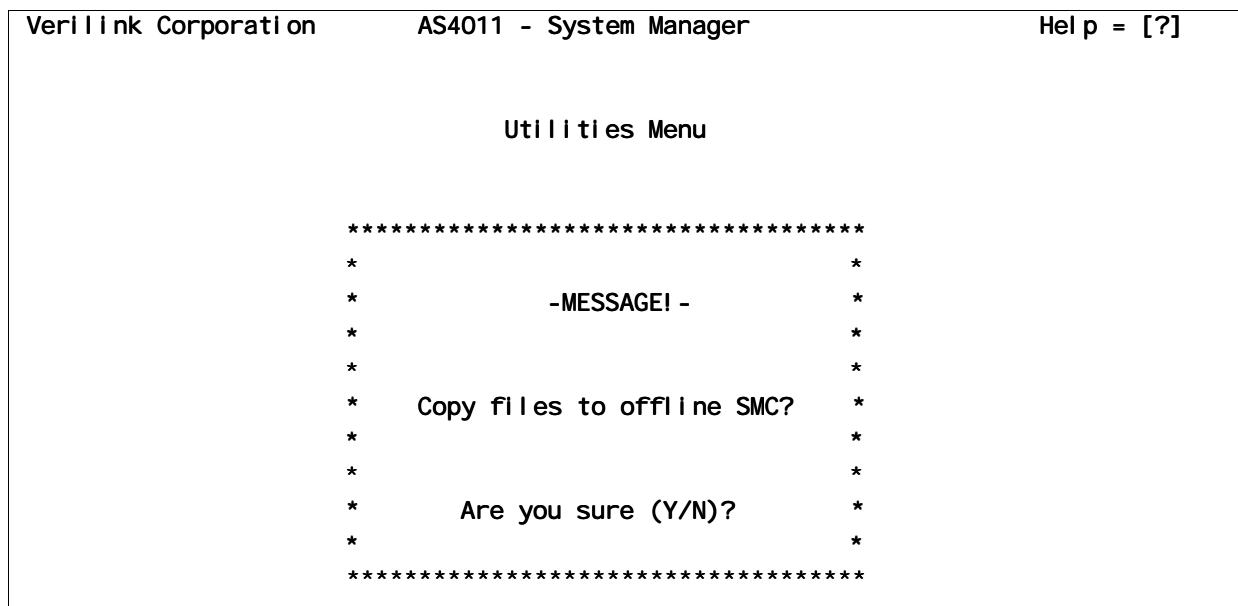
Figure 4-29 Utilities Menu

VeriLink Corporation	AS4011 - System Manager	Help = [?]
Utilities Menu		
Copy File System Switchover SMCs MIB Table Ping IP Route Table ARP Table Return to Default Settings Backplane Timeslots Display Initialize SMC Rearcard Modem File System Debug Counters Download Devices Software Reset All Channel Cards		

Copy File System

Use the Copy File System command to copy the configuration files from the active System Manager to the standby System Manager. Select Yes to copy all configuration files to the standby System Manager. The standby System Manager unpacks the individual files and then resets. This process is not usually required, because in the normal course of operation all of the configuration files are copied to any standby System Manager.

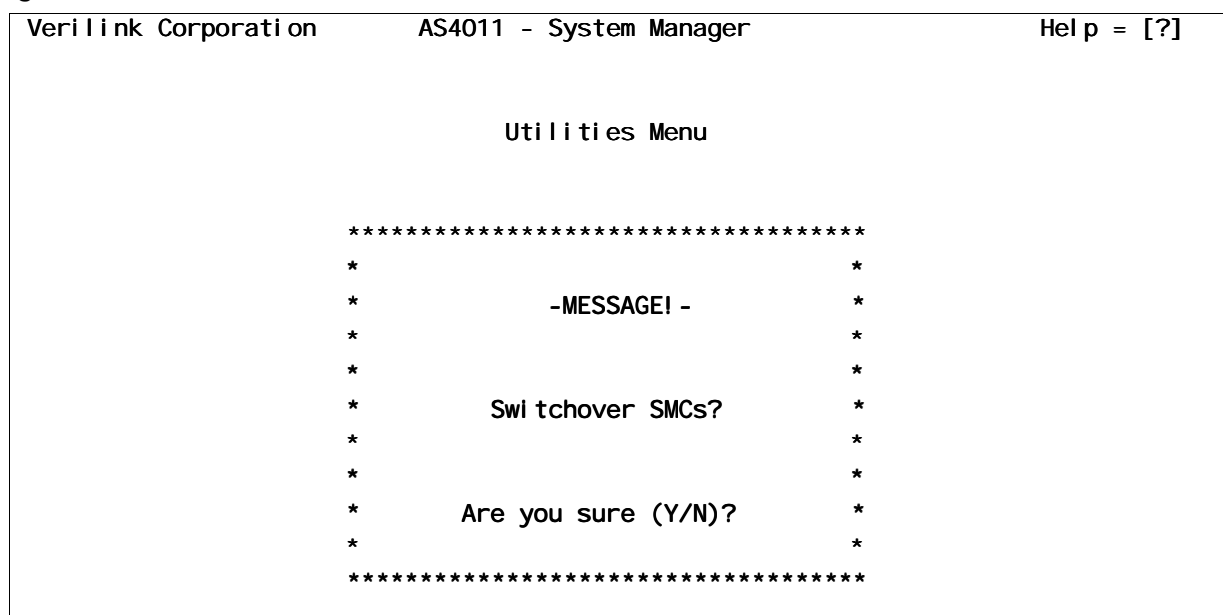
Figure 4-30 Copy File System Screen



Switchover SMCs

Use this command to switchover from the active System Manager to the standby System Manager. By selecting Yes, the standby System Manager becomes active, and the current System Manager becomes inactive.

Figure 4-31 Switchover SMC



MIB Table

The MIB display is used when managing a site with SNMP. The table displays the MIB-II parameters as defined in RFC1213.

Figure 4-32 MIB Table

MIB II display...			
***** IP variables *****			
iplnReceives...	155794	iplnHdrErrors:	0
iplnForwDatagrams:	0	iplnDiscards:	0
iplnUnknownProtos:	0	iplnOutRequest:	25581
iplnOutNoRoutes...	0	iplnReasmOKs :	0
***** ICMP variables *****			
icmpInMsgs...	43	icmpInErrors:	0
icmpInTimeExcds:	0	icmpInParmPr:	0
icmpInEchos...	25	icmpInEchoRp:	0
icmpInTstampRep:	0	icmpInAddrMa:	0
icmpOutMsgs...	25	icmpOutError:	0
icmpOutTimeExcd:	0	icmpOutParmP:	0
icmpOutRedirect:	0	icmpOutEchos:	0
icmpOutTimeStamp:	0	icmpTimeRep:	0
icmpOutAddrMaRe:	0	icmpOutAddrMasks:	0
***** UDP variables *****			
udpInDatagrams:	153388	udpNoPorts :	0
udpOutDatagrams:	22951	udpInErrors :	0
Press any key to continue...			

PING

After you enter the node address, count, and length, the unit responds with PING statistics. The screen displays the number of PINGS sent and received (echoed back) from the IP address, and the average length of time in milliseconds that it took for the PING request to be sent and received from the IP address. If the count is 0, the trip was accomplished in less than 10 ms.

Figure 4-33 PING Menu

VeriLink Corporation	AS4011 - System Manager	Help = [?]
Ping Menu		
<p>Ping Setup</p> <p>-----</p> <p>Node IP address.....: 192.94.45.229</p> <p>Ping count.....: 1000</p> <p>Number of bytes.....: 64</p> <p>Ping Statistics</p> <p>-----</p> <p>Pings sent.....: 5</p> <p>Pings received.....: 4</p> <p>Bytes received.....: 64</p> <p>Roundtrip delay(ms): 20</p> <p>Percent loss.....: 0.0 %</p> <p>[S]tart/Stop ping</p>		

Table 4-6 Ping Menu

Node IP Address	The IP address you want to PING. The address is entered in dotted decimal notation.
Ping Count	The number of times you want to PING the defined address. This field varies in pre-defined steps each time you press ENTER. Values are 1,10,1000 and Continuous.
Number of Bytes	The optional length (in bytes) of the PING message to be sent. The default value is the minimum packet size of 64 bytes.

IP Route Table

This table is used by the AS4000 to map the LAN network architecture. Select Show IP route to show a specific route for an individual destination.

Select Dump IP route table for a listing of every route and destination address stored.

Figure 4-34 .IP Route Table Menu

VeriLink Corporation	AS4011 - System Manager	Hel p = [?]
I P Route Tabl e Menu		
Show I P Route Dump I P Route Table		

Show IP Route Use this field to request routing information for a specific destination network address or a specific host address. Enter the requested route address in dotted decimal notation ([Figure 4-35](#)).

Figure 4-35 Show IP Route

VeriLink Corporation	AS4011 - System Manager	Hel p = [?]
Show I P Route Menu		
Requested route.: 0.0.0.0		
Route.....:	Port.....:	
Mask.....:	Hops.....: 0	
Next hop.....:	Ti meToLi ve.....:	

Dump IP route table This address is the destination network address or a specific host address. Each digit represents 8 bits of the address. The range of each digit is from 0-255 (see [Figure 4-36](#)).

Figure 4-36 Dump IP Route Table

IP route table display...					
Address	Mask	Next Hop	Port	Hops	Time To Live
-----	----	-----	----	----	-----
200.0.0.128	255.255.255.255	Direct	Internal	0	Forever
200.0.0.252	255.255.255.255	Direct	Internal	0	Forever
200.0.0.253	255.255.255.255	Direct	Internal	0	Forever
200.0.0.122	255.255.255.255	Direct	Internal	0	Forever
200.0.0.0	255.255.255.0	Direct	1	0	180
208.150.145.141	255.255.255.255	Direct	Internal	0	Forever
208.150.145.0	255.255.255.0	Direct	0	0	180
0.0.0.0	0.0.0.0	208.150.145.1	0	1	Forever
Press any key to continue...					

Table 4-7 Dump IP Route Table

Mask	This address is generated automatically and is represented in four octets (bytes), each with a decimal value of 0 to 255.
Next Hop	This is the IP address to which an IP frame is forwarded. The network portion matches the network portion of the AS4000 port. The next hop is represented in four octets (bytes), each with a decimal value of 0 to 255.
Port	This field identifies the port from which the datagram is sent. If it is set to 0, the port is a logical port. If it is set to Internal, it represents the AS4000 address.
Hops	This field represents the number of hops required to reach the remote IP network. The range is from 0-15.
Time To Live	This count represents the amount of time (in seconds) that an address can remain inactive before it is deleted. If the field is set to Forever, the address will not be deleted; it has been entered manually and will not age.

ARP Table Utility Display

ARP (Address Resolution Protocol as defined by RFC826) is used to obtain the physical layer address associated with an IP address. Mapping is created between the physical and IP addresses. The physical addresses are dynamically discovered by watching traffic on the LAN segment.

Figure 4-37 ARP Table Selection

ARP table display...				
Protocol	Address	Hardware Address	State	TimeToLive
-----	-----	-----	-----	-----
208.150.145.51		a0: 6a: 00: 0a: 73: a0	Resolved	277
208.150.145.139		a0: 6a: 00: 96: 91: 8b	Resolved	569
208.150.145.1		00: 60: 47: 1e: 3b: 5d	Resolved	600
Press any key to continue...				

Table 4-8 ARP Table Display

Protocol Address	This is the IP address of the device.
Hardware Address	This is the physical address (MAC—Media Access Control) associated with the IP address.
State	The State is either Pending or Resolved. If the AS4000 is in a Pending state, the address has not been resolved; the AS4000 is waiting for an ARP reply message.
Time To Live	This count represents the amount of time (in seconds) that the address can remain inactive before it will be deleted. The maximum count is 10 minutes (600 seconds).

Return to Default Settings

This parameter resets the system configuration. It erases the flash system, reformats and initializes the flash, and creates default configuration files. Any system configurations entered are erased.

Figure 4-38 Reset Configuration Dialog Screen

Verilink Corporation	AS4011 - System Manager	Help = [?]
Utilities Menu		
<pre> ***** * * * -MESSAGE! - * * * * Reset configuration? * * * * Are you sure (Y/N)? * * * ***** </pre>		

Backplane Timeslots Display

The **Backplane Timeslots Display** is a read-only diagnostic utility which provides a detailed list of all of the configured connections in the system. Each connection is defined by its backplane timeslot number (BTS), connection ID number (Cid), physical slot (SI), port (Po) and time slot assignment (Ts), and connection name.

Each connection is given a “flag” which defines the connection as

- Write to, or read-from connection
- A destination, or source connection
- A data or voice connection.

The flag also provides the tester slot and port as well as the bus associated with each connection.

Figure 4-39 Backplane Timeslots Display

----- DNX Backplane Timeslot Map Id = 1 Version =17 .-----					
----- Bus A Bts Writers and Readers Groups -----					
BTS	Cid	SI	Po	Ts	Flags
0040	0001	01.	01.	00	WSda8(00.00)
0040	0001	08.	01.	00	RDda8(00.00)

0041	0001	08.	01.	00	WDda8(00.00)
0041	0001	01.	01.	00	RSda8(00.00)

0042	0001	01.	01.	01	WSda8(00.00)
0042	0001	08.	01.	01	RDda8(00.00)

0043	0001	08.	01.	01	WDda8(00.00)
0043	0001	01.	01.	01	RSda8(00.00)

0044	0001	01.	01.	02	WSda8(00.00)
0044	0001	08.	01.	02	RDda8(00.00)

0045	0001	08.	01.	02	WDda8(00.00)
0045	0001	01.	01.	02	RSda8(00.00)

press <CR> to continue - any other key to exit.					

The flags are defined as follows:

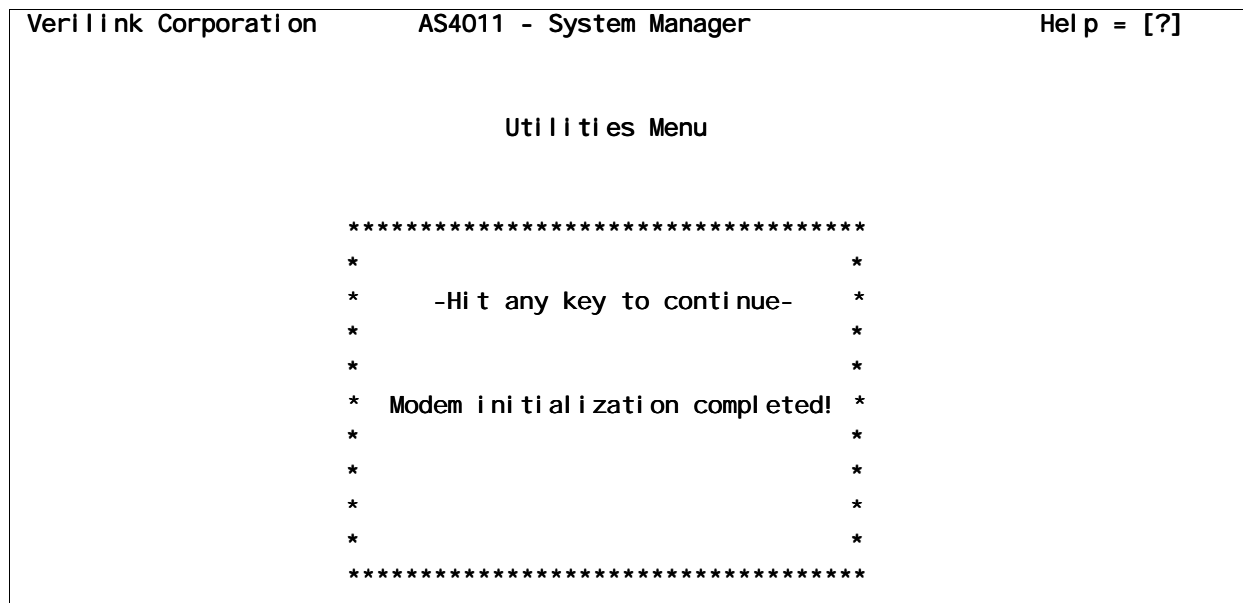
Table 4-9 Flag Definition

Sample Flags WDda#(00.00)*
The first character is a capital “W” or “R” W = Write to Backplane R = Read from Backplane
The second character is a capital “D” or “S” D = Destination S = Source
The third character is a lower-case “d” or “v” d = data v = voice
The fourth character is a lower-case “a” or “b” and: a = bus a b = bus b
The fifth character is the number of bits “7” or “8”
* The last characters (in parentheses) represent the tested slot and port numbers.

Initialize SMC Rear Card Modem

To access the Initialize **SMC Rear Card Modem** utility, navigate to the **Utilities Menu**. Any modem calls in progress will be disconnected.

Figure 4-40 Initialize SMC Rear Card Modem



File System Debug Counters

This menu describes the RAMdisk file system on the SMC, tracks deleted files, and shows how much space is left.

Figure 4-41 File System Debug Counters

X2 File System Statistics and Debug Counters Menu			
Invalid Volume.....	0	FDISK executed.....	0
Garbage Collection.....	0	Wipe Files.....	0
Wipe Disk.....	0	Open Files.....	0
Number of Readers.....	0	Number of Writers.....	0
nDisk information			

Volume Name.....	[DNX-SMC]	Chip Type..:	AMD AM29F040.
Total disk space.....	483328	Remaining disk space..:	463232
Total FAUs.....	3776	Available FAUs.....	3619
Total dir entries.....	1024	Free dir entries.....	981
Used dir entries.....	19	Deleted dir entries..:	24
File System Checksum..:	211685	File System Errors...:	0
- Press any key to exit -			

Download Devices Software

The **Download Devices Software Menu** allows you to download new software to one or all of the application modules in any slot. The SMC must have the actual program that you want to download to the application module. You also have the option to delete a program file, as well.

Downloading software varies from one operating system to another. Refer to Appendix A, [“TFTP and Telnet”](#) when downloading software.

Figure 4-42 Download Devices Software

```

VeriLink Corporation      AS4011 - System Manager      Help = [?]

                                Program Load Menu

                                Current Program File: ??? None ???

Slot#      Type      Program Version      Status
-----
01)      T3      T3-01.03I      OK
02)      Quad High Speed      Qhs_4.04L      OK
03)      ----      ----      Not Present
04)      ----      ----      Not Present
05)      Quad T-1      QT1_5.02K      OK *
06)      Quad T-1      QT1_5.02K      OK *
07)      Quad T-1      QT1_5.02K      Rear Card Missing
08)      Quad T-1      QT1_5.02K      Rear Card Missing
09)      ----      ----      Not Present
10)      ----      ----      Not Present
11)      Test Access      TAM 0202      OK

[L]oad device      Load [A]ll devices      [D]elete Program File

```

Reset All Channel Cards

This command resets all AS4000 application modules.

Figure 4-43 Reset All DMX Channel Cards

```
VeriLink Corporation      AS4011 - System Manager      Help = [?]
```



```
Utilities Menu
```



```
*****
*
*                               *
*               -MESSAGE! -    *
*                               *
*                               *
*                               *
*   Reset all DNX channel cards?  *
*                               *
*                               *
*   Are you sure (Y/N)?         *
*                               *
*****
```

About Menu

The **About Menu** branches to two submenus.

- System Profile
- Who Am I

System Profile

The **System Profile Display** provides information about the AS4000 node.

Figure 4-44 System Profile Display

Verilink Corporation	AS4011 - System Manager	Help = [?]
Verilink Corporation 145 Baytech Dr. San Jose, CA 95134 Tel - (800) 837-4546 FAX - (408) 262-6260		
System Manager Controller -----		
Connected to.....: SMCA System Desc.....: AS4000 - Release 6.03 SMC Version.....: SMC500I Release Date.....: Oct. 22, 1998 Checksum.....: 5D66 Xilinx Type.....: XC3030PC68 Xilinx Version...: 2350_06:10/8/97 12:00PM Rear Card Modem..: Yes		

The elements of the **System Profile Display** are detailed in [Table 4-10](#).

Table 4-10 System Profile Display

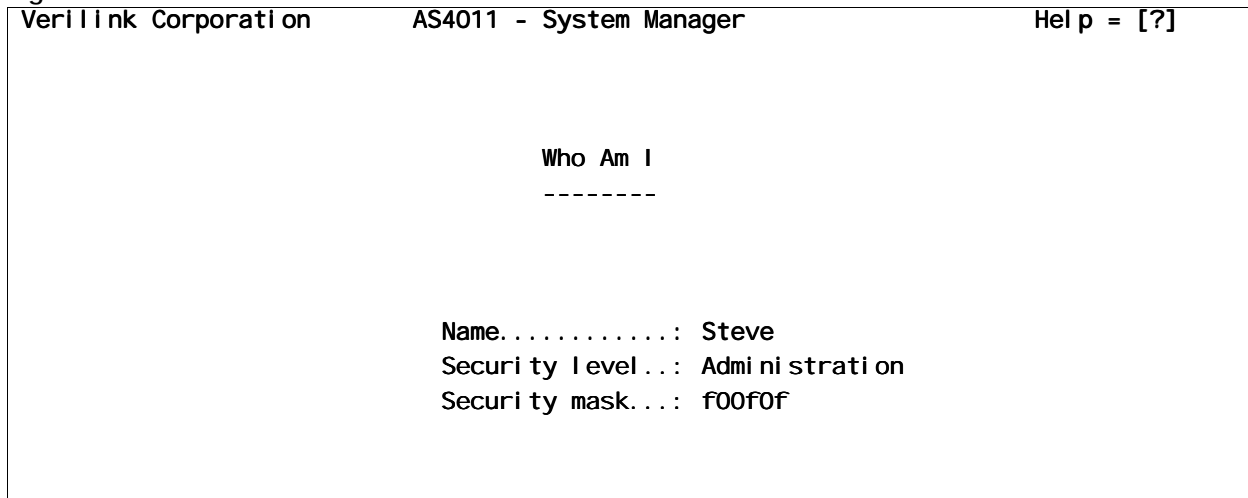
Display Element	Definition
Connected to	Which of the two possible System Manager Controller modules the user is accessing.
System Desc	Information field indicating product identity and revision information.
SMC Version	The firmware revision of the System Manager Controller.
Release Date	The date on which the installed firmware was released.
Checksum	The checksum stored with the installed firmware.

Display Element	Definition
Xilinx Type	The type of programmable Xilinx integrated circuit used in the SMC.
Xilinx Version	The manufacturer's version number of the Xilinx programmable IC.
Rear Card Modem	Yes if a rearcad modem is present (typical), No if no modem is found.

Who Am I

The **Who Am I Menu** may be used to examine the access level of the current user. After inputting the correct password for the current user, a screen of information is displayed.

Figure 4-45 Who Am I



Chapter 5

Quad DS-1 Module

The AS4000 module which is labelled Quad DS-1 Module on its front panel presents console menus in which it is called a Quad T1 module. In order to avoid confusion with the similar AS3000 product known literally as a "QUAD T1 module"—in this document the AS4000 Quad DS-1 module is always called a Quad DS-1 module.

The Quad DS-1 module contains four full-featured T1 Channel Service Units (CSUs). Each of the 4 CSUs can be independently placed in or out of service. Each CSU may be optioned differently or the same as any other.

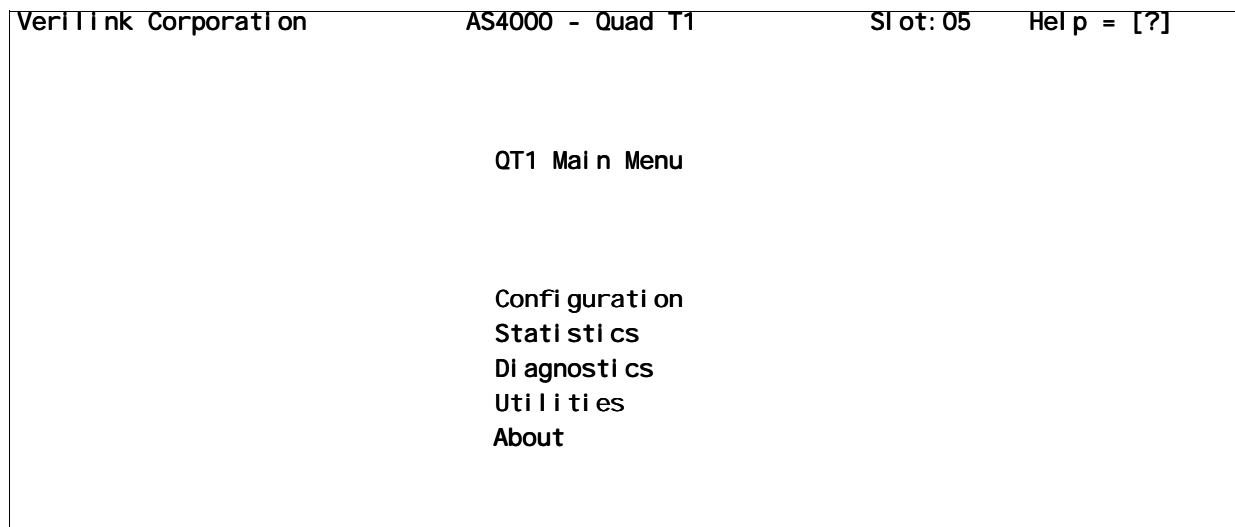
Quad DS-1 Configuration

NOTE: *In order to view the menus associated with the Quad DS-1 module, you must have the Quad DS-1 card in the equipment shelf, and the slot must be configured for Quad DS-1.*

If you have just connected to the AS4000 node, from the **Main Menu**:

- Select **Node Summary**
- Use your spacebar or cursor arrow keys to highlight the desired Quad DS-1 module
- Press ENTER to access the **Quad DS-1 Main Menu**.

Figure 5-1 Quad DS-1 Main Menu



DS-1 Port Configuration

The Quad DS-1 configuration files are stored on the System Controller. Thus, when replacing a Quad DS-1 module, the old configuration will be preserved.

Figure 5-2 Quad DS-1 Port Configuration Menu

Verilink Corporation	AS4000 - Quad T1			Slot: 05	Help = [?]
Quad T-1 card port configuration					
	Port #1	Port #2	Port #3	Port #4	
Name.....:	Port #1	Port #2	Port #3	Port #4	
Framing.....:	ESF	ESF	ESF	ESF	
Line code....:	B8ZS	B8ZS	B8ZS	B8ZS	
LBO.....:	0 db	0 db	0 db	0 db	
Density.....:	Clear	Clear	Clear	Clear	
Ntwk Loops...:	Enable	Enable	Enable	Enable	
Yellow alarm:	Yes	Yes	Yes	Yes	
ESF format...:	54016	54016	54016	54016	
Unused DS0's:	Busy	Busy	Busy	Busy	
Port Status :	In Service	In Service	In Service	In Service	
Cascade Leds when Idle: Yes					

Table 5-1 Quad DS-1 Port Configuration Menu.

Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad DS-1. Some users find it beneficial to use circuit numbers to name the ports.
Framing	This information must be obtained from the network supplier. Choose either D4 or ESF. D4 (SuperFrame) consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193 bit frame consists of 192 bits preceded by one framing bit (the F bit). ESF (Extended SuperFrame) includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbit/s link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data—all without interrupting normal operations.
Line Code	This information must be obtained from the network supplier. Choose between AMI (Alternate Mark Inversion) and B8ZS (Bipolar with 8 Zero Substitution).
LBO (Line Build Out)	Set to 0 dB unless the network supplier specifically requests otherwise. The options are 0, 7.5, 15 or 22 dB.
Density	This information must be obtained from the network supplier. Choose Clear or 62411. A Clear network imposes no ones density requirements on the user. A 62411 network complies with AT&T Technical Reference #62411 and limits the AS4000 Quad DS-1 module transmission to no more than fifteen consecutive zeros. If the Line Code entry is B8ZS, choose Clear. If the Line Code entry is AMI, choose 62411.

Network Loops	This entry determines the T1 module's ability to respond to diagnostic commands received from the network supplier. Select Yes or Enable unless the commands are to be passed to another T1 device that will respond.
Yellow Alarm	Yes causes the T1 module to discard data and send a Yellow Alarm if it is in a Red Alarm condition for three seconds. Yes must be chosen if the network supplier is a common carrier, such as a telephone company.
ESF Format	This entry describes the types of ESF network commands that the DS-1 module responds to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.
Unused DS0s	This selection determines whether the code transmitted over the unused DS0s is Idle or Busy.
Port Status	This field determines the status of the port. The status is In Service or Out of Service.

Viewing ESF Statistics and Registers

To view the ESF Statistics and Registers, select the **Statistics** menu from the **Quad DS-1 Main Menu**:

Figure 5-3 ESF Statistics Menu

VeriLink Corporation	AS4000 - Quad T1	Slot: 05	Help = [?]
ESF statistics menu			
ESF statistics			
ESF registers			

ESF Statistics

The ESF statistics display provides information about T1 circuit performance. This information is only available for a T1 circuit which uses ESF framing. D4 T1 circuits offer no method of error checking other than the rudimentary bipolar violation detection.

Figure 5-4 Quad DS-1 ESF Statistics Display

VeriLink Corporation		AS4000 - Quad T1				Slot: 05		Help = [?]	
Quad T-1 ESF statistics									
Register	Port #1		Port #2		Port #3		Port #4		
	Curr 24Hr		Curr 24Hr		Curr 24Hr		Curr 24Hr		
Errored secs.....:0	0	0	0	0	0	0	0	0	
Failed secs(UAS):.0	0	0	0	0	0	0	0	0	
Severe error secs:0	0	0	0	0	0	0	0	0	
Bursty error secs:0	0	0	0	0	0	0	0	0	
Loss of frame cnt:0	0	0	0	0	0	0	0	0	
Time In Interval.:363	363		363		363		363		
# Valid interval:196	196		196		196		196		
ESF status.....:00000000	00000000		00000000		00000000		00000000		

Access both current and 24-hour ESF statistics from this screen. The “Current Statistics” column displays the counts for the current time interval (maximum fifteen minutes). The “24-Hour Statistics” column displays the counts for the preceding 24-hour period.

Table 5-2 ESF Statistics Screen Definitions

Errored secs	The occurrence of a Loss of Frame or a CRC-6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.
Failed secs (UAS)	Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred. Also known as Unavailable Seconds.
Severe error secs	A one-second period in which three hundred twenty (320) or more CRC-6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.
Bursty error secs	A one-second period in which more than one but less than 320 CRC-6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.
Loss of frame cnt	A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.
Time in interval	A timer that tracks the number of seconds in the current 15-minute interval.
# of Valid intervals	A counter that tracks the total number of 15-minute intervals in a 24-hour period (up to 96).

ESF status	<p>This field defines the status of the T1 line. The status is defined by an eight-digit number:</p> <p>FU0000LO</p> <p>Digit #1 - "F" or "O" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.</p> <p>Digit #2 - "U" or "O" where "U" indicates an unavailable signal state.</p> <p>Digit #3 through #6 and #8 are always "O."</p> <p>Digit #7 - "L" or "O" where "L" indicates that the T1 line is in loop.</p>
-------------------	--

ESF Registers In accordance with industry standards such as AT&T 54016 and ANSI T1.403, the Quad DS-1 module allows user access to registers in which information is stored about circuit performance.

On an ESF T1 facility, the use of CRC-6 error checking allows each device to have detailed information about circuit performance. The Quad DS-1 module stores these results for the previous 24 hours on each of the 4 T1 ports.

Figure 5-5 ESF Registers Summary Port Selection Menu

VeriLink Corporation	AS4000 - Quad T1	Slot: 05	Help = [?]
<p>Quad T1 ESF register summary menu</p> <p>-----</p> <p>Port 1 - Port #1</p> <p>Port 2 - Port #2</p> <p>Port 3 - Port #3</p> <p>Port 4 - Port #4</p>			
E[x]it menu			

The **ESF Registers Menu** gives the same information as the **ESF Statistics Menu** but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period. The ESF Registers screen for the selected port is shown in [Figure 5-6](#).

Figure 5-6 ESF Registers for a Port

VeriLink Corporation

AS4000 - Quad T1

Slot: 05

Help = [?]

ESF registers...

Port #3

INT	ES	FS	SES	BES	INT	ES	FS	SES	BES	INT	ES	FS	SES	BES
01.	000	000	000	000	17.	000	000	000	000	33.	000	000	000	000
02.	000	000	000	000	18.	000	000	000	000	34.	000	000	000	000
03.	000	000	000	000	19.	000	000	000	000	35.	000	000	000	000
04.	000	000	000	000	20.	000	000	000	000	36.	000	000	000	000
05.	000	000	000	000	21.	000	000	000	000	37.	000	000	000	000
06.	000	000	000	000	22.	000	000	000	000	38.	000	000	000	000
07.	000	000	000	000	23.	000	000	000	000	39.	000	000	000	000
08.	000	000	000	000	24.	000	000	000	000	40.	000	000	000	000
09.	000	000	000	000	25.	000	000	000	000	41.	000	000	000	000
10.	000	000	000	000	26.	000	000	000	000	42.	000	000	000	000
11.	000	000	000	000	27.	000	000	000	000	43.	000	000	000	000
12.	000	000	000	000	28.	000	000	000	000	44.	000	000	000	000
13.	000	000	000	000	29.	000	000	000	000	45.	000	000	000	000
14.	000	000	000	000	30.	000	000	000	000	46.	000	000	000	000
15.	000	000	000	000	31.	000	000	000	000	47.	000	000	000	000
16.	000	000	000	000	32.	000	000	000	000	48.	000	000	000	000

Next/previous page = [Return/Space]

Table 5-3 ESF Register Definitions

Errored Seconds (ES)	The occurrence of a Loss of Frame or a CRC-6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.
Failed Second (FS)	Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred. Also known as Unavailable Seconds.
Severely Errored Second (SES)	A one-second period in which three hundred twenty (320) or more CRC-6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.
Bursty Errored Seconds (BES)	A one-second period in which more than one but less than 320 CRC-6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Diagnostics Menu

The **Diagnostics Menu** is used to perform loopbacks and tests for the purpose of verifying connections or troubleshooting problems.

Quad DS-1 Diagnostics

To view and perform diagnostics on the Quad DS-1 module, select the **Diagnostics Menu** from the **Quad DS-1 Main Menu**:

Figure 5-7 Quad DS-1 Diagnostics Menu

Verilink Corporation		AS4000 - Quad T1		Slot: 05		Help = [?]	
Diagnostic Menu							
Name.....: Port #1		Port #2		Port #3		Port #4	
Port Status....: In Service		In Service		In Service		In Service	
Loop selection.: Off		Off		Off		Off	
NI BERT.....: Off		Off		Off		Off	
Error seconds...: 0		0		0		0	
Seconds in test: 0		0		0		0	
State ErrSec		State ErrSec		State ErrSec		State ErrSec	
AIS.....: No 0		No 0		No 0		No 0	
RED.....: No 3295		No 3291		No 3288		No 3286	
YEL.....: No 3		No 2		No 2		No 2	
Ferr.....: No 3295		No 3292		No 3289		No 3287	
CRC6.....: No 3295		No 3292		No 3289		No 3287	
BPV.....: No 2		No 2		No 2		No 2	
LOS.....: No 3294		No 3291		No 3288		No 3286	
[R]eset counts Insert Bert [E]rrors							

Table 5-4 Quad DS-1 Diagnostics Menu

Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad DS-1. Some users find it beneficial to use circuit numbers to name the ports.
Port Status	This field determines the status of the port. The status will either be In Service or Out of Service.
Loop selection	If you turn the local loop ON, the front panel LP LED will illuminate and local testing can be performed by external DTE equipment or by the AS4000's internal BERT.
NI BERT	The Network Interface Bit Error Rate Tester is useful for testing the error rate of the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.
Error seconds	This read-only count represents the number of errored seconds that occurred in a one second period while the Quad DS-1 module was in test.

Seconds in test	This read-only count represents the number of seconds the Quad DS-1 module was in test.
State	This field shows whether the alarm is active or not.
ErrSec	This read-only count represents the number of errored seconds that occurred in a one-second period while the T1 module was in test.
AIS	An unframed All Ones condition has been detected.
RED	A Loss of Frame Alignment has occurred and synchronization has been lost.
YEL	A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not receiving the AS4000 signalling correctly (i.e., the network is not in sync or a Red Alarm has occurred).
Ferr (framing errors)	One or more frame alignment bit errors have been detected. This does not mean, however, that synchronization has been lost.
CRC6	One or more CRC-6 block errors have been detected. The D4 framing does not include CRC-6.
BPV	Bipolar violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.
LOS	This indicates a loss of signal detection. No signal is present on the RX pair to the AS4000 DS-1 module (T1 loop).
[R]eset counts	This command allows you to clear your counters.
Insert Bert [E]rrors	For test purposes, you can insert BERT errors.

Quad DS-1 Utilities Menu

The **Quad DS-1 Utilities Menu** offers six functions.

Figure 5-8 Quad DS-1 Utilities Menu

Verilink Corporation	AS4000 - Quad T1	Slot: 05	Help = [?]
Quad T-1 Utilities			
Board Status: In Service Reset Quad T-1 Board Monitor System Manager Clock Voice Control Signal display Dump Connection Statistics System Manager Interface			

Table 5-5 Quad DS-1 Utilities

Board Status	Used to toggle the Quad DS-1 module in or out of service. The user is asked to confirm changes.
Reset Quad T-1 Board	Used to re-initialize a Quad DS-1 module. The user is asked to confirm the reset.
Monitor System Manager Clock	Presents a dynamic display of clock information useful for debugging system level clocking issues. See Figure 5-9 .
Voice Control Signal display	Presents a dynamic display of the status of the A,B,C and D signalling bits which are used for voice call setup and call supervision. See Figure 5-10 .
Dump Connection Statistics	Displays information about the connections mapped to this module.
System Manager Interface	Displays debug information which may be helpful if contacting Verilink Technical Support.

Monitor System Clock

[Figure 5-9](#) shows a typical display produced when Monitor System Manager Clock is selected. This screen exists for debug purposes, use it under the direction of Verilink Technical Support.

Figure 5-9 Monitor System Manager Clock Display

VeriLink Corporation		AS4000 - Quad T1		Slot: 05	Help = [?]
Monitor Backplane Integrity					
Slot #	Slot #	Slot #	Pattern	Patt.	Status
-----	Address	Received	Address	Rcv	(Ignore for QHS)
Slot #1	0x00205007	0d	0x00205008	0d	
Slot #2	0x00205009	0d	0x0020500a	0d	
Slot #3	0x0020500b	0d	0x0020500c	0d	
Slot #4	0x0020500d	0d	0x0020500e	0d	
Slot #5	0x0020500f	05	0x00205010	01	... OK ...
Slot #6	0x00205011	06	0x00205012	04	... OK ...
Slot #7	0x00205013	07	0x00205014	02	... OK ...
Slot #8	0x00205015	08	0x00205016	0b	... OK ...
Slot #9	0x00205017	0f	0x00205018	0f	
Slot #10	0x00205019	0f	0x0020501a	0f	
Slot #11	0x0020501b	0f	0x0020501c	0f	
Lost System Clock Count.: 1					
Lost Frame Sync Count...: 1			Invalid Signal Ram Locations: 0		
OnBusBadClock Count: 0			Total Scanner Sweeps: 33760		
OffBusGoodClock Ctr: 0			Total Signal Dirty Sweeps: 0		
[R]eset Clock Cntrs [C]lear Ram Cntrs					

Voice Control Signals

You can view real-time voice signalling bit information in the **Voice Control Signal Display**, see [Figure 5-10](#).

T1 standards define the use of four signalling bits (designated A,B,C and D) for setting up and supervising telephone calls.

In most cases today only the first two bits, A and B, are used for call setup. Bits C and D are still available for historical and standards compliance reasons.

The signalling bits indicate conditions such as:

- Receiver off-hook and requesting dial tone
- Incoming call (ring)
- Call in progress (busy)
- Line idle (available)

The **Voice Control Signal Display** shows the status of the signalling bits for each of the 24 timeslots (DS0s) in the selected T1.

Figure 5-10 Voice Control Signal Bit Display

VeriLink Corporation

AS4000 - Quad T1

Slot: 05

Help = [?]

PCM signalling display menu...

Port #1		From	To			From	To				
		Framer	Framer			Framer	Framer				
	Write	-----		Read		Write	-----		Read		
DS0	BTS	ABCD	ABCD	BTS		DS0	BTS	ABCD	ABCD	BTS	
=====											
1	**	No Connection			**<-	13	**	No Connection			**
2	**	No Connection			**	14	**	No Connection			**
3	**	No Connection			**	15	**	No Connection			**
4	**	No Connection			**	16	**	No Connection			**
5	**	No Connection			**	17	**	No Connection			**
6	**	No Connection			**	18	**	No Connection			**
7	**	No Connection			**	19	**	No Connection			**
8	**	No Connection			**	20	**	No Connection			**
9	**	No Connection			**	21	**	No Connection			**
10	**	No Connection			**	22	**	No Connection			**
11	**	No Connection			**	23	**	No Connection			**
12	**	No Connection			**	24	**	No Connection			**

I/O Address

Data

Trans.

I/O Address

Data

Monitor

DS0: 01

[N]ext Port

[C]lear Transitions

Meaningful only for timeslots being used for ordinary Pulse Code Modulation (PCM) voice traffic, the information in this display is defined in [Table 5-6](#).

Table 5-6 Voice Control Signals

Key	Definition
DS0	One of the 24 timeslots in a DS-1 signal.
BTS	Backplane Time Slot—refers to the time division multiplexing taking place on the midplane of the AS4000 shelf. Used for debug purposes only.
ABCD	Status of the A, B, C, and D signalling bits which are used to setup and supervise telephone calls across a T1 circuit.

About Menu

The About Menu provides access to information about the Quad DS-1 module firmware and hardware revisions.

Figure 5-11 About Menu

VeriLink Corporation	AS4000 - Quad T1	Slot: 05	Help = [?]
<p>Version.....: QT1_6.01I Release Date.....: March 26, 1999 Checksum.....: 26BF Xilinx Version.....: 1510_16. Voice Signalling Version: 1 Ram Access.....: 16 bits wide</p>			

Table 5-7 Quad DS-1 About Menu

Version	This is the software version current in the T1's flash memory.
Release Date	The engineering release to production.
Checksum	The sum of all bytes in the T1's flash memory at power up.
XILINX Version	The hardware version of downloadable, programmable devices.
Voice Signalling Version	The revision level of software used in the command bits for voice signalling.
Ram Access	The size of the memory bus.

Chapter 6

Quad Port Sync Data Module

The AS4000 module which is labelled Quad Port Sync Data on its front panel presents menus to the console port in which it is identified as a Quad High Speed module or a QHS module. All three terms refer to the same device, a four-port synchronous serial data interface module which supports EIA 530, V.35 or RS-232 electrical interface specifications.

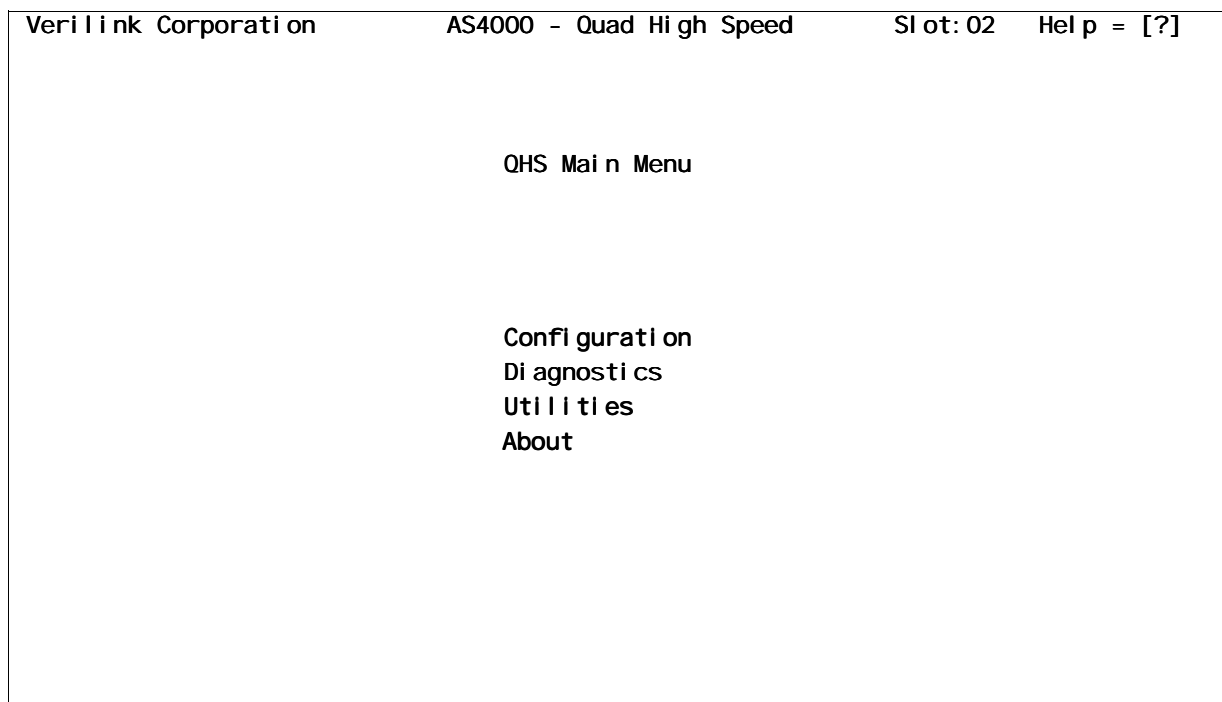
This chapter describes the Quad Port Sync Data module in detail and provides information on configuration, diagnostics and utilities.

Quad Port Sync Data Main Menu

From the AS4000 **Main Menu**:

- Select the **Node Summary Menu**
- Select **Quad High Speed** module
- Select **Configuration**

Figure 6-1 Quad Port Sync Data module Main Menu



Configuration Menu

From the Quad Port Sync Data module **Main Menu**, select **Configuration** to setup and configure the four T1 ports.

Figure 6-2 Quad Port Sync Data Configuration Menu

VeriLink Corporation	AS4000 - Quad High Speed	Slot: 02	Help = [?]
Configuration Menu			
Port 1	Port 2	Port 3	Port 4
Name.....: port name	port name	port name	port name
Speed.....: 1536000	0	0	0
Timing.....: Internal	Internal	Internal	Internal
DCD out.....: Forced On	Forced On	Forced On	Forced On
DSR out.....: Forced On	Forced On	Forced On	Forced On
Data.....: Normal	Normal	Normal	Normal
Clock.....: Normal	Normal	Normal	Normal
Interface....: V. 35	V. 35	V. 35	V. 35
V. 54 Loop....: Disabled	Disabled	Disabled	Disabled
Connect Event: Disabled	Disabled	Disabled	Disabled
Port Status...: In Service	In Service	In Service	In Service
Cascade Leds when Idle: Yes			

Table 6-1 Quad Port Sync Data Configuration Menu

Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad Port Sync Data module.
Speed	The Quad Port Sync Data module operates at speeds from 48 kbit/s to 2.048 Mbit/s (Nx56/64 kbit/s). This field indicates the total bandwidth which has been allocated through the port by the Connections Map Manager of the System Control module.
Timing	The timing options are Internal, Int/Ext, or External. Internal is the normal setting and should always be chosen unless there is a specific reason to do otherwise. When internal is used, the transmit clock is derived from the system clock used by the entire AS4000 node. This facilitates time division multiplexing. The Quad Port Sync Data module will provide both TX clock and RX clock to the DTE.
DCD Out	The Quad Port Sync Data module presents a DCE interface to the attached customer equipment. Carrier detect can be forced off, forced on, track RTS, or switched. Switched is normally on and turns off upon network carrier failure (red alarm).
DSR Out	Data Set Ready can be forced off, forced on, or allowed to track DTR.
Data	The options are Normal or Inverted. They must match at both ends of the circuit. If it is known that the data stream will have low ones density, selecting inverted will increase the density of the data stream. This is never necessary for a circuit traversing a B8ZS T1. For an AMI T1 use 56 kbit/s per timeslot instead of inverting data.

Clock	Ideally, the DTE presents transmit data so that the negative-going transition of transmit clock occurs in the middle of each bit. On long cables when transmit clock is sent from the DCE device to clock data from the DTE device, the data arrives delayed with respect to transmit clock due to the round trip cable delay. When the delay is such that the negative-going clock transition occurs at about the time of transition from one data bit to the next—sampling errors will occur. The Inv option will correct this condition by causing the Quad Port Sync Data module to delay its sampling 180 degrees of a clock cycle—until the positive-going clock transition. Initially choose Normal. If frequent errors occur at the port, try Inverted and check results at the far-end DTE device.
Interface	The interface options are V.35, RS 530/422 and RS-232.
V.54 Loop	When enabled, this port will respond to receipt of a remote digital loop command arriving from the port of the far-end Quad Port Sync Data module (or industry standard DSU). When disabled, it will not respond to any remote loop command.
Connect event	Enables or disables the connection or disconnection of a port to be recorded in the System Event menu.
Port status	This field determines the status of the port. The status will either be in service or out of service.
Cascade LEDs when Idle	When selected, any unused ports will display a moving pattern of blinking LEDs.

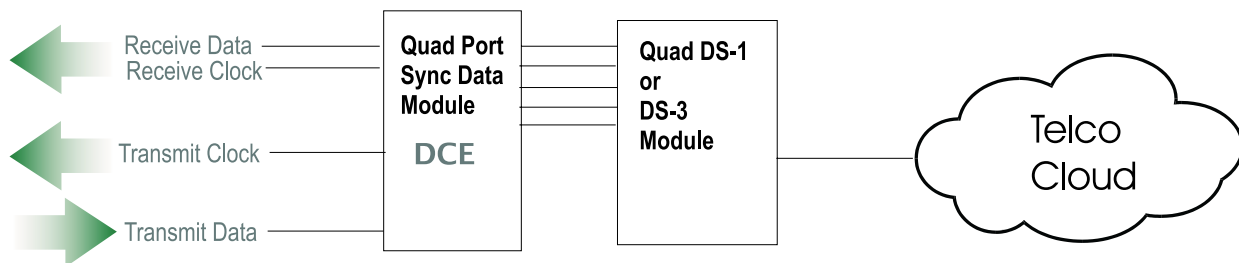
More About Timing

The following applies to the Quad DS-1 Sync Data module as well as synchronous serial interfaces in general.

DCE Outputs Clock

Data Communications Equipment (DCE) outputs clock. Data Terminal Equipment (DTE) accepts clock as an input. The AS4000 Quad Port Sync Data module always functions as DCE, so it always outputs clocks. The connected DTE monitors the transmit clock signal and presents data to be sent to the far-end (transmit data) at the rate of the transmit clock signal. See [Figure 6-3](#).

Figure 6-3 DCE Outputs Clock



Receive Data and both clocks are outputs from the Quad Port Sync Data module

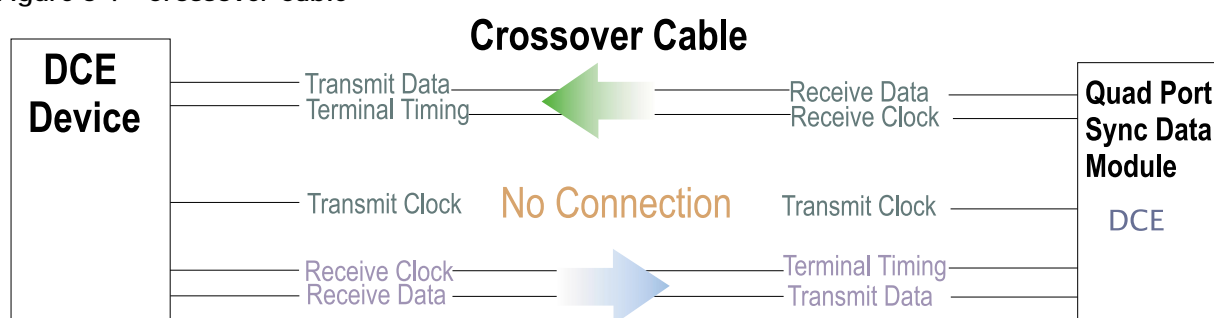
Int/Ext Timing

Int/Ext is recommended if the attached user DTE cable exceeds 10 feet in length and the customer data rate exceeds 224 kbit/s. In order for the Int/Ext selection to work, the DTE must wrap the

transmit clock signal back towards the Quad Port Sync Data module on the optional third pair of clock leads (TT in EIA-530, SCTE in V.35, XTC in RS-232).

Crossover Timing When two Data Communications Equipment (DCE) devices are connected together in order to extend a circuit to a third location, a crossover cable must be used.

Figure 6-4 Crossover Cable



On the AS4000 Quad Port Sync Data, Int/Ext must be used. The attached equipment is also DCE. The attached DCE must accept the Receive Clock provided by the AS4000 data port as an input on its terminal timing pair. This clock is used as the transmit clock of the locally attached DCE device. The remote DCE must be loop timed to achieve the required timing lock with the AS4000 system clock.

External should be used if the attached equipment is DCE that does not accept a clock, such as a Digital Dataphone Service (DDS) DSU. The DSU and the AS4000 system must be locked to the same timing source (usually network clock).

The external DCE device can provide timing to the AS4000 system only when it is attached to port 1 and the port is configured as source clock. Remember that an AS4000 node may have only one clock source. It may not be desirable to time an entire node from a single external low data rate circuit.

System Level Timing The System Manager module stores the shelf timing table for all modules within the shelf. Each module uses this shared timing source. Two backup timing sources are available for the system. If the timing source fails, the designated backup module automatically assumes the timing duties.

Diagnostics Menu

The **Diagnostics Menu** supports loopbacks and test patterns for two purposes:

- To verify that a circuit is error-free before placing it into service
- For troubleshooting when it is known that some problem exists

Quad Port Sync Data Module

To view and perform diagnostics on the Quad Port Sync Data module, select the **Diagnostics Menu** from the **Main Menu**.

Figure 6-5 Quad Port Sync Data Diagnostics Menu

VeriLink Corporation		AS4000 - Quad High Speed		Slot: 02	Help = [?]
Diagnostic Menu					
Name.....:	San Mateo	Los Angeles	Walnut Creek	Sacramento	
Status.....:	In Service	In Service	In Service	In Service	
Local Loop.....:	Off	Off	Off	Off	
Remote Loop....:	Off	Off	Off	Off	
BERT.....:	Off	Off	Off	Off	
Seconds in test:	0	0	0	0	
Local Errors...:	0	0	0	0	
Remote Errors...:	0	0	0	0	
Indicators:					

TX/RX Data.....:	On /On	Off/Off	Off/Off	Off/Off	
RTS/DCD.....:	Off/On	Off/On	Off/On	Off/On	
DTR/DSR.....:	Off/On	Off/On	Off/On	Off/On	
[R]eset counts Insert [e]rrors					

Table 6-2 Diagnostic Menu

Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad Port Sync Data module.
Status	The unit's status is either In Service or Out of Service.
Local Loop	When set to ON, this parameter causes a bi-directional local loop at the Sync Data Port Data Module where the command was entered. If you turn the local loop ON, the front panel LOOP LED will illuminate and local testing can be performed by external DTE equipment or by AS4000's internal BERT.

BERT	This is useful to test for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality. The remote loop and data test patterns depend on interface clocks to operate. If Int/Ext or External timing options are selected, ensure the External Clock is present and locked to the AS4000 system clock.
Seconds in Test	This read-only count represents the number of seconds the module was in test.
Local Errors	This read-only count represents the number of local errored seconds that occurred while the data module was in test.
Remote Errors	This read-only count represents the number of remote errored seconds that occurred while the module was in test.
TX/RX Data	These fields indicate whether your Quad Port Sync Data module is transmitting or receiving data over its serial port interface.
RTS/DCD	If RTS is On, the DTE is presenting the control lead Request To Send. If DCD is On, your Quad Port Sync Data module is asserting Data Carrier Detect to the DTE.
DTR/DSR	If DTR is On the DTE is presenting the control lead Data Terminal Ready. If DSR is On, your Quad Port Sync Data module is asserting Data Set Ready to the DTE.
[R]eset counts	This command allows you to clear your counters.
Insert [e]rrors	For test purposes, you can insert BERT errors. This is done to verify the port is receiving its own test pattern, rather than a test pattern from some other source in the network. It is useful for verifying that a loopback does exist in the circuit path.

More About Loopbacks

Local Loop and Remote Loop on the Quad Port Sync Data module are both bi-directional loopbacks. If everything is working as expected, for either loopback, the local and remote DTE should receive its own data stream. Devices capable of detecting and reporting a loopback should indicate either type of loop.

The data flow for local and remote loops is indicated in [Figure 6-6](#).

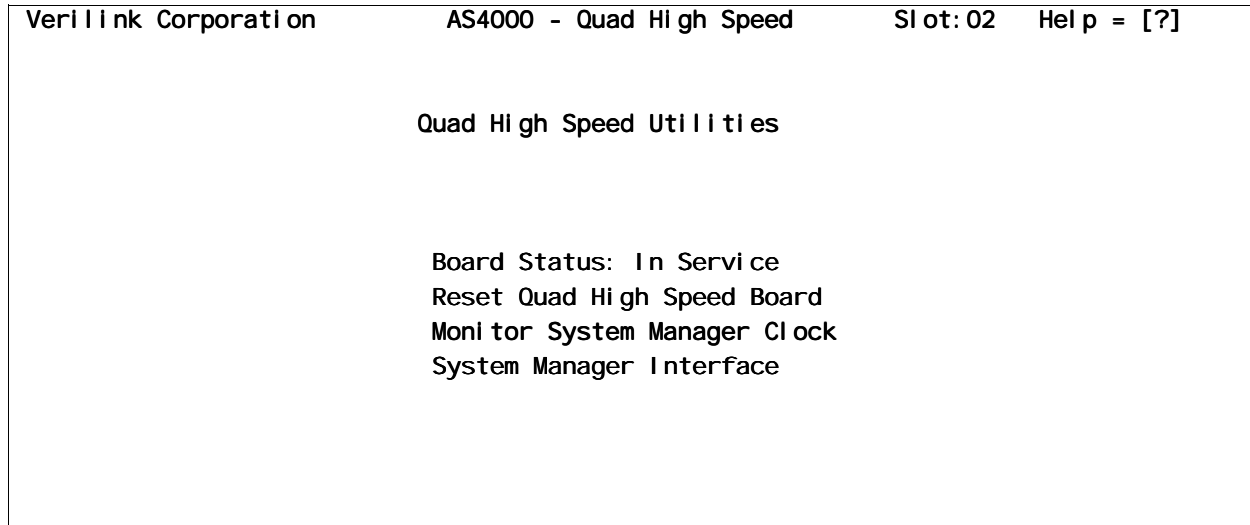
Figure 6-6 Quad Port Sync Data Loopbacks



Utilities Menu

The **Utilities Menu** is used to place the module in and out of service, reset the entire module, or observe detailed operational status information.

Figure 6-7 Quad Port Sync Data Utilities Menu



Depending upon your level of security, you may or may not be able to access all of the fields shown in the screen above. The Administrator level allows you access to all of the fields on this screen.

- Board Status - shows whether the board is in service or out of service.
- Reset Quad High Speed Board - resets or re-initializes the Quad Port Sync Data module.
- Monitor System Manager Clock - gives the status of vital system timing. See [Figure 6-8](#).
- System Manager Interface - provides system manager statistics, such as map checksum and byte count. See [Figure 6-9](#).

System Manager Clock Display

The Monitor System Manager Clock selection on the Quad Port Sync Data **Utilities Menu** produces a display which may be useful if troubleshooting a system level timing problem.

Figure 6-8 Monitor System Manager Clock Display

Verilink Corporation		AS4000 - Quad High Speed		Slot: 02	Help = [?]
Monitor Backplane Integrity					
Slot #	Slot #	Slot #	Pattern	Patt.	Status
-----	Address	Received	Address	Rcv	(Ignore for QHS)
Slot #1	0x00205007	01	0x00205008	01	... OK ...
Slot #2	0x00205009	01	0x0020500a	01	
Slot #3	0x0020500b	01	0x0020500c	01	
Slot #4	0x0020500d	01	0x0020500e	01	
Slot #5	0x0020500f	05	0x00205010	01	... OK ...
Slot #6	0x00205011	06	0x00205012	04	... OK ...
Slot #7	0x00205013	07	0x00205014	02	... OK ...
Slot #8	0x00205015	08	0x00205016	0a	... OK ...
Slot #9	0x00205017	0b	0x00205018	0b	
Slot #10	0x00205019	0b	0x0020501a	0b	
Slot #11	0x0020501b	0b	0x0020501c	0b	... OK ...
System Clock Count.: 1					

Use this menu only at the direction of Verilink Tech Support.

System Manager Interface Display

The System Manager Interface selection on the **Utilities Menu** displays information related to system-level configuration information, especially connection maps.

Figure 6-9 System Manager Interface Display

Verilink Corporation	AS4000 - Quad High Speed	Slot: 02	Help = [?]
System Manager Interface Status			

Configuration Map sequence number.....: 17			
Downloaded Config Map sequence number...: 17			
Configuration Map Checksum.....: E882			
Configuration Map Byte Count.....: 192			
Number of Configuration Map changes.....: 4			
Number of Configuration Maps downloads...: 3			
System Manager Level Identifier.....: 500			
System Manager Id.....: 115			
System Files sequence number.....: 3			

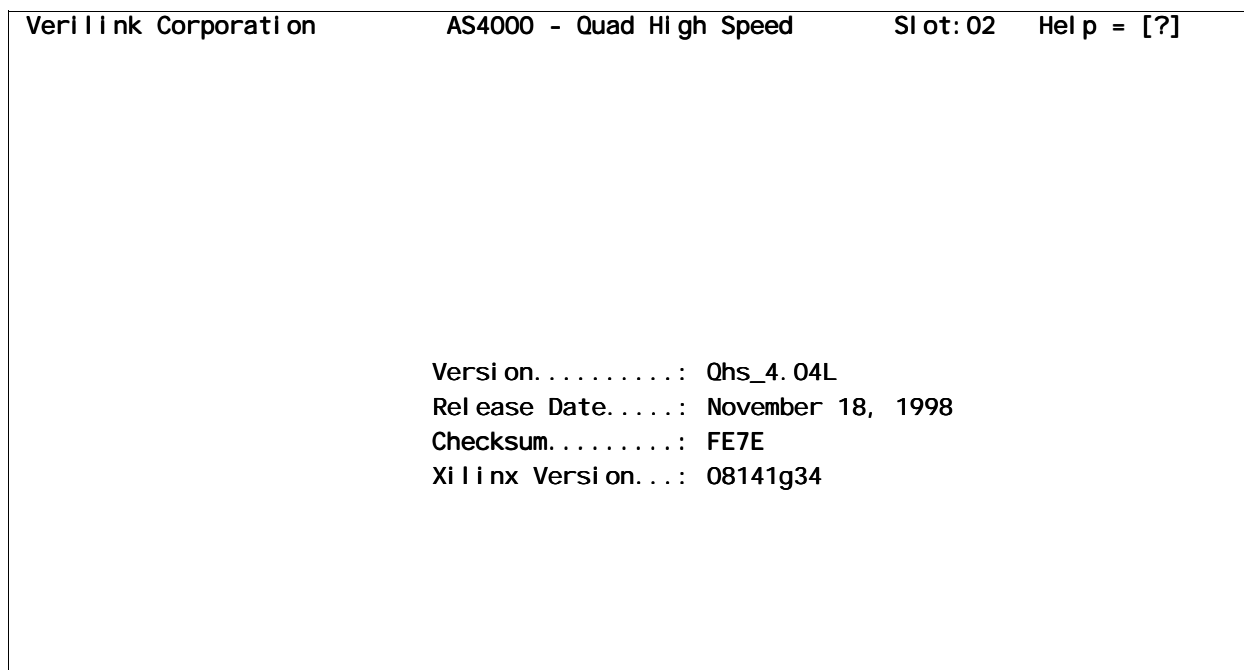
Table 6-3 System Manager Interface

Configuration Map sequence number	A number used to identify the current configuration map. This will usually match the next field.
Downloaded Config Map sequence number	The identifying number for the most recently downloaded configuration map.
Configuration Map Checksum	The error-checking sequence for the current map.
Configuration Map Byte Count	The number of eight-bit characters in the current map.
Number of Configuration Map changes	The number of times changes have been made to the current configuration map.
Number of Configuration Maps downloads	The number of times that any configuration map has been downloaded since power-up.
System Manager Level Identifier	The revision level of the operating System Manager code.
System Manager Id	The hardware revision of the operating System Manager module.
System Files sequence number	An arbitrary value assigned to the current set of system files.

About Menu

The **About Menu**, illustrated in [Figure 6-10](#), gives revision information about the Quad Port Sync Data module hardware and software.

Figure 6-10 Quad Sync Data About Menu



DS-3 Module

The AS4000 module which is labelled DS-3 Module on its front panel presents console menus in which it is called a T3 module. In this document the AS4000 DS-3 module is always called a DS-3 module.

The DS-3 module manages and combines up to 28 DS-1 data streams (voice, data and video applications) into a T3 or fractional T3 data stream (DS3 C-bit parity and M1-3 M-frame structure for DS1 to DS3).

DS-3 Configuration

To view the menus associated with the DS-3 module, you must have the DS-3 module in the shelf and the slot must be configured for a module type of T3. If the slot is configured, an entry will appear on the **Node Summary Menu**. Refer to "[Slot Configuration](#)" on page 4-21 if you have not already configured the slot.

From the Main Menu:

- Select **Node Summary**
- Select the **DS-3** module

The DS-3 **Configuration Menu** is presented. This menu offers three selections. See [Figure 7-1](#).

Figure 7-1 Configuration Menu

VeriLink Corporation	AS4000 - T3	Slot: 01	Help = [?]
<p style="text-align: center;">Configuration Menu</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">T1 Configuration</p> <p style="text-align: center;">T3 Configuration</p> <p style="text-align: center;">Options</p>			
<p>Navigate menu = [Space/Backspace]</p> <p>Change parameter = [Return/'B']</p> <p>Exit/abort edits = ['X'/Esc]</p>			

DS-3 Configuration Menu

In addition to its single T3 network interface, the DS-3 module is also a time division multiplexer which combines up to 28 DS-1 rate data streams to form a Digital Signal Level 3 (DS-3). In some cases the user may have contracted with their network service provider for only a portion of the DS-3 bandwidth, this practice is called fractional T3 service.

Select **T1 Configuration** to configure which of the 28 possible T1 timeslots will be used to build the T3.

Select **T3 Configuration** to setup the parameters for the T3 aggregate signal.

Invoke the **Options** selection to select options for the T1 links and the T3 line.

T1 Configuration Manager

The **T1 Configuration Manager** is used to configure the 28 virtual T1 circuits which are multiplexed into the T3.

Figure 7-2 T1 Configuration Manager Menu

Verilink Corporation		AS4000 - T3		Slot: 01		Help = [?]	
T1 Configuration Manager							
Chl	Name	Status	Frm	Density	NetLp	Yalrm	Format ICode

01	First of 28 T1s	In Service	ESF	Clear	No	No	54016 Idle
02	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
03	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
04	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
05	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
06	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
07	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
08	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
09	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
10	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
11	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
12	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
13	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
14	Circuit Number	Out Of Service	D4	Clear	No	No	54016 Busy
Navigate menu = [Space/Backspace]							
Change parameter = [Return/' B']		[N]ext Page		[C]opy Cfg To All			
Exit/abort edits = [' X' /Esc]							

Table 7-1 T1 Configuration Manager Menu

Channel (Chl)	The channel number refers to the T1. The first screen displays the first 14 T1s. Press N to display the remaining 14 T1s. Place the cursor over the T1 to be configured and press ENTER to invoke the T1 Channel Configuration Menu .
Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each virtual T1. In the example menu above the first "channel" has been named "First of 28 T1s" while the remaining fields are in their default state.
Status	This field refers to the state of the virtual T1 circuit. Put the T1 circuits you will be using in service. Leave unused T1s out of service (default).
Framing (Frm)	If this virtual T1 is mapped to a T1 port on a Quad DS-1 module, select the same framing type as is used on that actual T1 circuit. If the T1 is mapped to a Quad Port Sync Data module this selection is arbitrary. Choose either D4 or ESF.
Density	This selection matters only if this virtual T1 is mapped to an actual T1 circuit. Clear imposes no ones density requirements on the user. 62411 complies with AT&T Technical Reference 62411 and limits the T1 to no more than fifteen consecutive zeros. If mapped to a B8ZS T1 or if no physical T1 circuit is involved, choose Clear. If this virtual T1 maps to an actual T1 using AMI line coding, choose 62411.
Network Loops (NetLp)	This parameter determines the DS-3 module's ability to respond to diagnostic commands received in a T1 from a circuit end-point or provider. Select Yes only if you wish to allow loopbacks within this T1 portion of the T3.

Yellow Alarm	Yes causes the T1 module to discard data and send a Yellow Alarm if it is in a Red Alarm condition for three seconds. Yes must be chosen if the network supplier is a common carrier, such as a telephone company.
Format	This entry describes the types of ESF network commands that the T1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.
ICode	The Idle Code selection determines what condition the A and B signalling bits will be forced to on an unused T1 line. Choose busy to send the A and B bits as ones and mark the timeslots as unavailable for voice traffic (typical). Choose idle to leave the A and B bits in a zero state, indicating btimeslots are available (usually unwise).

Figure 7-3 T1 Channel Configuration Menu

Verilink Corporation	AS4000 - T3	Slot: 01	Help = [?]
T-1 Channel Configuration			
Channel Nbr.: 1 Name.....: First of 28 T1s Framing.....: ESF Status.....: In Service Density.....: Clear Ntwk loops..: No Yellow alarm: No ESF format..: 54016 Unused DS0's: Idle			
Navigate menu = [Space/Backspace] Change parameter = [Return/' B'] Exit/abort edits = [' X' /Esc]			

T1 Channel Configuration Menu

Most of the fields shown in [Figure 7-3](#) are described in the previous pages. ESF format and Unused DS0's are described below.

- **ESF format** - This entry describes the types of ESF network commands that the T1 module responds to. It has no meaning for D4 networks. With ESF networks this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.
- **Unused DS0's** - This selection determines whether the data that is transmitted over the unused DS0s will be Idle or Busy.

T3 Port Configuration Menu

To access the **T3 Port Configuration Menu**, from the **Main Menu**:

- Select **Node Summary**
- Select **T3**
- Select **T3 Configuration**.

Figure 7-4 T3 Port Configuration Menu

Verilink Corporation	AS4000 - T3	Slot: 01	Help = [?]
T-3 port configuration			
Name.....:	Circuit Number		
Unit.....:	DefU		
Facility Id.....:	Def - Facility Id		
Port Number.....:	Def - Port No.		
Generator #.....:	Def - Generator No.		
Equipment Id.....:	Def - EID		
Location Id.....:	Def - LID		
Frame Id.....:	Def - FID		
M13 Operating Mode.....:	C-Bit Parity		
Rcv Loop Timing.....:	Disabled		
Short Cable < 50'.....:	No		
M13 Remote Loopback Type:	3rd C-Bit Inverted		
Rcv AIS Selection.....:	Framed 1010, C-Bit=0, X-Bit disregarded		
Xmit AIS Selection.....:	ANSI		
Navigate menu = [Space/Backspace]			
Change parameter = [Return/' B']			
Exit/abort edits = [' X' /Esc]			

Table 7-2 T3 Port Configuration Menu

Name	Name of this unit.
Unit	Device identifier.
Facility Id	Identifies the facility where the equipment is located.
Port Number	Number of the port.
Generator #	Number generated.
Equipment Id	Identifies the equipment in use.
Location Id	Identifies where the equipment is located.
Frame Id	Identifies the equipment rack in the Central Office.
M13 Operating Mode	Framing selection for the DS1 to DS3 multiplexing. This can be either C-Bit Parity or Bellcore M13.

Receive Loop Timing	If Enabled, the DS-3 module uses the clock frequency it recovers from the receive circuitry to derive transmit clock as well, if Disabled the DS-3 module uses internal transmit clock.
Short Cable	Select Yes if the cable to the exchange carrier DS-3 equipment is less than 50 feet long. Select No for a cable equal to or longer than 50 feet.
M1-3 Remote Loopback	<p>To support loopbacks initiated by the T3 service provider, select the loopback type which your provider uses. Get this information from the service provider. Available selections are:</p> <p>Stuff Bit = 0—The stuff bit is always a zero, applies only to M1-3 framing.</p> <p>Stuff Bit = 1—The stuff bit is always a one, applies only to M1-3 framing.</p> <p>3rd C-Bit Inverted—The third C bit is inverted in each DS-3 frame.</p> <p>2nd C-Bit Inverted—The second C bit is inverted in each DS-3 frame.</p> <p>1st C-Bit Inverted—The first C bit is inverted in each DS-3 frame.</p> <p>3rd C-Bit & Stuff Bit Inverted—The third C bit and each stuff bit are inverted in each DS-3 frame. Applies only to M1-3 framing.</p> <p>2nd C-Bit & Stuff Bit Inverted—The second C bit and each stuff bit are inverted in each DS-3 frame. Applies only to M1-3 framing.</p> <p>1st C-Bit & Stuff Bit Inverted—The first C bit and each stuff bit are inverted in each DS-3 frame. Applies only to M1-3 framing.</p> <p>Stuff Bit Inverted—All stuff bits are inverted in each DS-3 frame. Applies only to M1-3 framing.</p>
Rcv AIS Selection	The received bit pattern that will be interpreted as an Alarm Indication Signal. Consult with your network service provider to insure your selection matches their equipment configuration.
Xmit AIS Selection	The bit pattern that will be transmitted, as an Alarm Indication Signal, to indicate that a red alarm condition exists in this DS-3 module. Consult with your network service provider to insure your selection matches their equipment configuration.

Options Menu

To access the DS-3 Module **Options Menu**, from the **Main Menu**:

- Select **Node Summary**
- Select **T3**
- Select **Options**

Figure 7-5 Options Menu

VeriLink Corporation	AS4000 - T3	Slot: 01	Help = [?]
Options Menu			
T1 FDL Management.....: Enabled T1 Reset T1 Framer On Error...: Enabled T1 One Second Maintenance.....: Enabled T1 Ignore Rx/Tx Slips.....: No T1 Link Loop Down Duration....: 8 T3 One Second Maintenance.....: Enabled T3 Ignore DS1 Loop Request.....: Yes Post Debug Events.....: Disabled			
Navigate menu = [Space/Backspace] Change parameter = [Return/'B'] Exit/abort edits = ['X' /Esc]			

Table 7-3 Options Menu Fields

T1 FDL Management	If enabled, allows use of the Facilities Data Link portion of ESF framing.
T1 Reset T1 Framer On Error	If enabled, forces the T1 framer to resynchronize after an outage.
T1 One Second Maintenance	If enabled, allows up to one second before reporting alarm conditions.
T1 Ignore Rx/Tx Slips	If enabled, ignores instability of receive and transmit clocks.
T1 Link Loop Down Duration	Length of time, in seconds, to send loop request codes.
T3 One Second Maintenance	If enabled, allows up to one second before reporting alarm conditions.
T3 Ignore DS1 Loop Request	If enabled, no action is taken by the AS4000 on receipt of loop codes.
Post Debug Events	If enabled, verbose error messages appear on screen. Use only at the direction of Verilink Tech Support.

Diagnostics Menu

To access the DS-3 **Diagnostics Menu**, from the **Main Menu**:

- Select **Node Summary**
- Select the desired T3 module
- Then select **Diagnostics**

Figure 7-6 Diagnostics Menu

VeriLink Corporation	AS4000 - T3	Slot: 01	Help = [?]
<p style="text-align: center;">D i a g n o s t i c M e n u</p> <p style="text-align: center;">-----</p> <p style="text-align: center;"> L i n e D i a g n o s t i c s C e n t e r L i n k T i m e s l o t P r o f i l e D i s p l a y A c t i v e T S F M D i s p l a y T S F M S t a t i s t i c s D i s p l a y D e b u g B a c k p l a n e C o n n e c t i o n C o m p l e t e T S F M D i s p l a y E x p o s e L i n e I n t e r f a c e U n i t R e g i s t e r s D u m p </p> <p> N a v i g a t e m e n u = [Space/Backspace] C h a n g e p a r a m e t e r = [Return/'B'] E x i t / a b o r t e d i t s = ['X' /Esc] </p>			

Using the Diagnostics Menu

Depending upon your security level, several submenus can be invoked. Most of the menus are for debug purposes. Only the **Line Diagnostics Center Menu** should be invoked for testing purposes.

Table 7-4 Line Diagnostics Center

Line Diagnostics Center	See next page for menu and description.
Link Timeslot Profile Display	Displays a profile of the application card connections.
Active TSFM Display	Shows which timeslots are currently in use.
TSFM Statistics Display	Shows how many timeslots are not available or in use, and which links are in use.

Debug Backplane Connection	Allows you to make loop connections on the backplane.
Complete TSFM Display	Displays all of the information gathered from the previous screens and displays them here for a full view.
Expose Line Interface Unit	Adiagnostic tool used to view register values associated with the rear board.
Registers Dump	A diagnostic tool that allows you to access registers within the Motorola processor.

Line Diagnostics Center

From the **Line Diagnostics Center**, several submenus may be invoked to perform additional diagnostic actions, such as loopbacks, and additional statistics. These tests can be performed on the entire T3 or on only a specific T1 within the T3.

Figure 7-7 Line Diagnostics Center Menu

Verilink Corporation			AS4000 - T3			Slot: 01		Help = [?]	
			Diagnostics Manager						
			Back						
T1	Name	Loop	Plane	Status	Red	Yel	Crc	Total	
01	First of 28 T1s	Off	Off	OK	0	0	1	14	
02	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
03	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
04	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
05	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
06	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
07	Circuit Number	Off	Off	Out Of Service	0	0	0	0	
T3 Circuit Number			Loop: Off						
LOS: Off			OOF: Off			AIS: Off		IDL: Off	
PBittErr: 0			CBittErr: 0			FecErr: 0		SesErr: 0	
BERT: Off			Local Errs: 0			Remote Errs: 0		Duration: 0	
Navigate menu = [Space/Backspace]			[T]1-Bert(2047)			[L]lu-Bert		[O]ff Bert	
Change parameter = [Return/'B']			ESF [S]tatistics			ESF [R]egisters			
Exit/abort edits = ['X']/Esc]			[N]ext			[E]xpose		[C]lear	
								[I]n Service	

T3 Loopbacks

To initiate or terminate a T3 loopback, press **ENTER** while the cursor is over the T3 loopback area in the center of the screen (default position on accessing menu). An example loopback selection display appears in [Figure 7-8](#) and a graphic illustrating the two available loopbacks appears in [Figure 7-9](#). Press **ENTER** until the desired loop (or off) is displayed, then press **"X"** to end the selection process. The user is asked to confirm the selection.

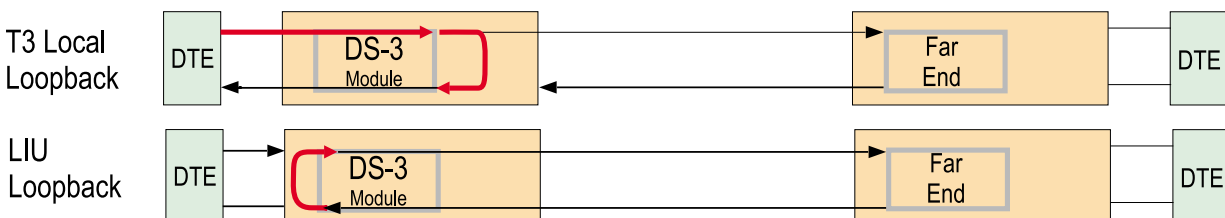
Figure 7-8 T3/LIU Loop Select Screen

VeriLink Corporation	AS4000 - T3	Slot: 01	Help = [?]
<p>T3/LIU Loop Select Screen</p> <p>-----</p> <p>Loop Type: Off</p>			
<p>Navigate menu = [Space/Backspace] Change parameter = [Return/'B'] Exit/abort edits = ['X' /Esc]</p>			

T3 Loopbacks Illustrated

The T3 local loopback faces the local AS4000 system. The LIU loopback faces the T3 network. These loopbacks are not bi-directional.

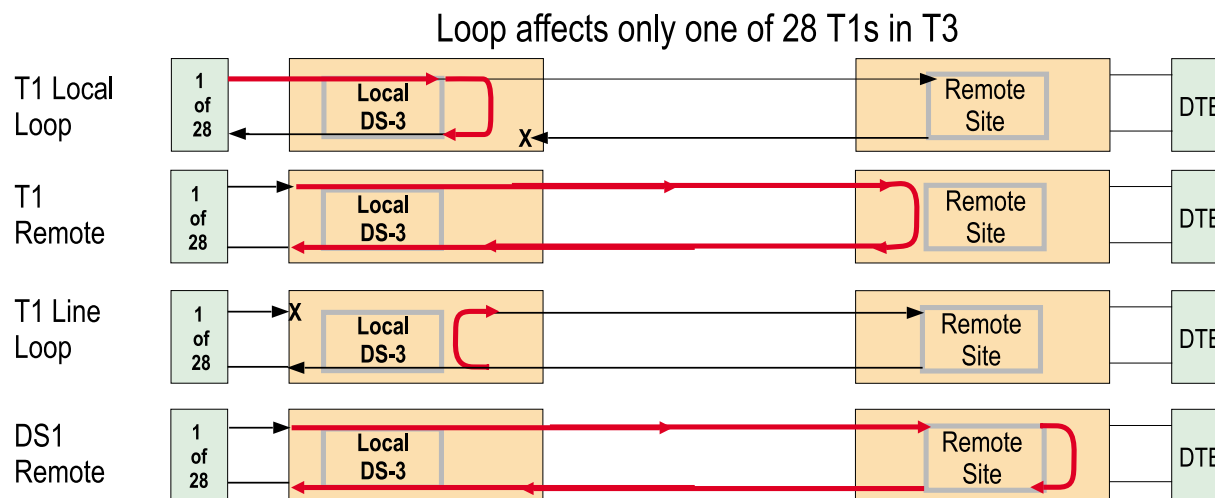
Figure 7-9 T3 Local and LIU Loopbacks



T1 Loopbacks

To loop one of the 28 T1 circuits, on the **Line Diagnostics Center Menu**, navigate to the number of the desired T1 and press ENTER. There are six selections, continue pressing ENTER until the selection you want is shown. Press "X" to leave the selection menu and begin the loopback. [Figure 7-10](#) illustrates the loopback types.

Figure 7-10 DS-3 Module T1 Loopbacks



Utilities Menu

From the **Main Menu**:

- Select **Node Summary**,
- Select **T3**,
- and then select **Utilities**.

Depending upon your security level, several submenus can be invoked.

- System Manager Interface - provides system manager statistics, such as map checksum and byte count. This menu exists for debug purposes and should be used only at the direction of Verilink Tech Support.
- Reset Board - re-initializes the board.

Figure 7-11 Utilities Menu

Verilink Corporation	AS4000 - T3	Slot: 01	Help = [?]
<p>T3 Module Utilities Menu</p> <p>System Manager Interface</p> <p>Reset Board</p>			

About Menu

To access the DS-3 Module **About Menu**, from the **Main Menu**:

- Select **Node Summary**
- Select **T3**
- and then select **About**

Table 7-5 **DS-3 Module About Menu**

Version	This is the software version current in the T3's flash memory.
Release Date	The engineering release to production.
Checksum	The sum of all bytes in the T3's flash memory at power up.
XILINX Version	The hardware version of downloadable, programmable devices.
Front Card Type	Displays the type of board in the system.
Front Card Rev	Displays the board's revision level.
Rear Card Type	Displays the type of board in the system.
Rear Card Rev	Displays the board's revision level.

Figure 7-12 About Menu

Verilink Corporation	AS4000 - T3	Slot: 01	Help = [?]
About T3 Module			
Version.....: T3-01.04C			
Release Date.....: March 30, 1999			
Checksum.....: 1A9D			
Xilinx Version...: t3_xlx14			
Front Card Type...: T3			
Front Card Rev...: 0			
Rear Card Type...: T3			
Rear Card Rev...: 0			

Chapter 8

Test Access Module (TAM)

This chapter describes the Test Access Module.

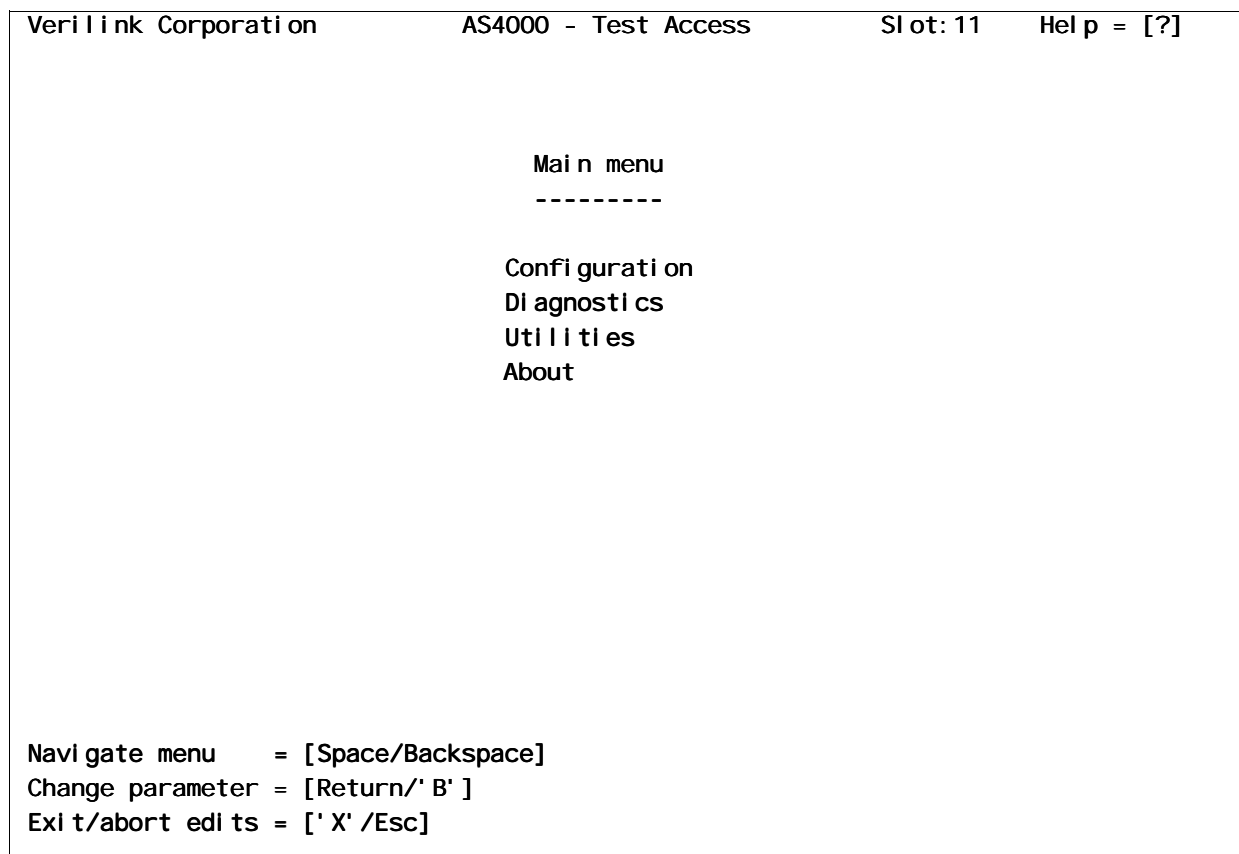
Test Access Module Configuration

Use the Test Access Module to temporarily redirect a connection to a port where an external test set is connected.

From the **Main Menu**:

- Select **Node Summary**
- Select the **Test Access** module (see [Figure 8-1](#))
- Select Test Access Module (TAM) **Configuration** (see [Figure 8-2](#))

Figure 8-1 Main Menu



Test Access Module Configuration Menu

Use this menu to configure control leads, select electrical interface types, and set the phase relationship of transmit data and transmit clock.

Figure 8-2 Configuration Menu

VeriLink Corporation		AS4000 - Test Access		Slot: 11	Help = [?]		
Configuration menu							
Port 1		Port 2		Port 3		Port 4	
Name.....: Test One		Test Two		Test Three		Test Four	
Speed.....: 0		0		0		0	
Timing...: Internal		Internal		Internal		Internal	
DCD out...: Forced On		Forced On		Forced On		Forced On	
DSR out...: Forced On		Forced On		Forced On		Forced On	
Data.....: Normal		Normal		Normal		Normal	
Clock.....: Normal		Normal		Normal		Normal	
Interface: V. 35		V. 35		V. 35		V. 35	
V. 54 loop: Disabled		Disabled		Disabled		Disabled	
Navigate menu = [Space/Backspace]							
Change parameter = [Return/' B']							
Exit/abort edits = [' X' /Esc]							

The options on the TAM **Configuration Menu** are described in [Table 8-1](#).

Table 8-1 TAM Configuration Menu

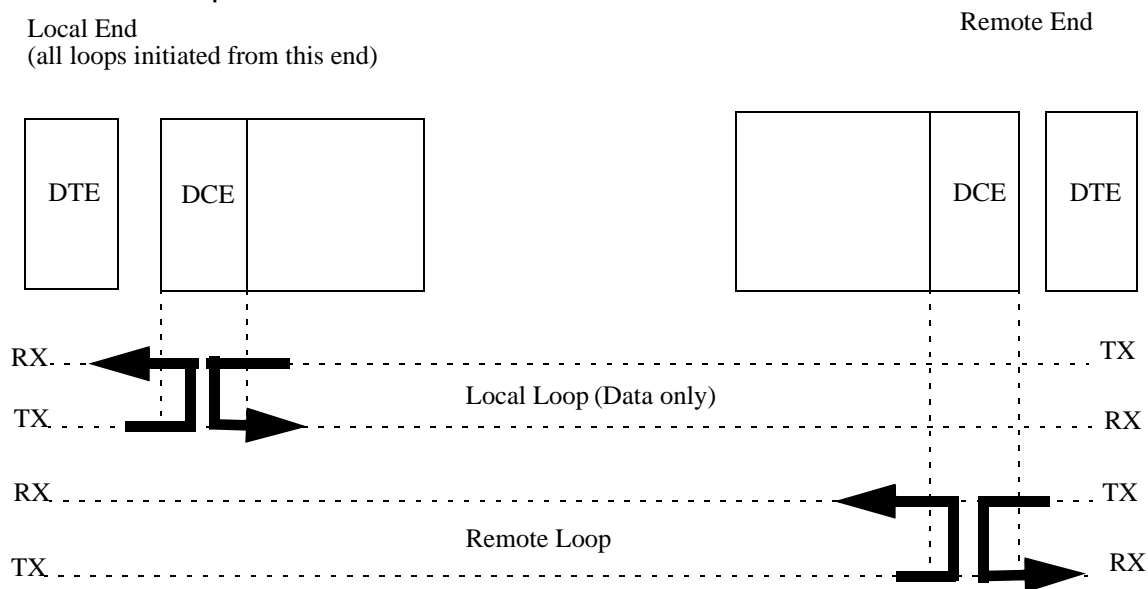
Name	This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Test Access Module.
Speed	The Test Access Module operates at speeds from 48 kbit/s to 2.048 Mbit/s, and any multiple of 56/64 kbit/s. Latching loopback sequences can be performed only at 56/64 kbit/s.
Timing	The tester interface timing is set to Internal and can not be changed. Test equipment attached to the TAM I/O port must accept clocks from the TAM.
DCD Out	The TAM card presents a DCE interface to the attached test equipment. Carrier detect can be Forced Off, Forced On, or Track RTS (DCD is On if RTS is On).
DSR Out	Data Set Ready can be Forced Off, Forced On, or Track DTR.

Data	The options are Normal or Inverted. Inverted causes ones to be sent as zeros and zeros to be sent as ones. This might be done in an effort to increase the ones density of a signal. This option must be set the same at both ends of a circuit.
Clock	Initially choose Normal. If frequent errors occur at the port, try Inverted and check performance of received data at the far end.
	Normally, the down-going clock edge is in the middle of each bit. On lengthy cables when a clock is sent from one device to clock data from the other device, the data arrives skewed from the originating clock due to the round trip cable delay. When the delay is such that the originating clock down-going edge is on the edge of the bit returned, Inverted will correct this condition.
Interface	The interface options are V.35, RS 530/422 and RS-232.
V.54 Loop	The TAM card does not respond to the V.54 loop.

Remote Loop	<p>Remote Loop causes a remote line loop at the distant end of a point-to-point circuit. There are several options you can choose from when you select remote loop. They are as follows:</p> <ul style="list-style-type: none"> • Off - turns off the previously entered device in latching (sustained) loopback. • Latching loop off - turns off any device in latching loopback. • V.54 loop off - turns off any device in V.54 Loopback. • V.54 - places V.54 responsive device in loopback, typically these loops are supported by DSUs and sometimes by channel cards of time division multiplexers. • Latching CSU - punches through repeaters if present and places the CSU in latching loopback. • Latching OCU - places the OCU in latching loopback. • Latching DSU - places the DSU in latching loopback. • Latching Smartjack NEI - places smartjack in latching loopback. • Latching Repeater #1 - latches the first repeater on the loop. • Latching Repeater #2 - latches the second repeater after punching the first. • Latching DS0 Dataport Drop side - latches DS0 dataport in latching loopback. • Latching DS0 Dataport Line side - latches DS0 dataport in latching loopback. • Latching Loop side interface - places the latching loopback interface in latching loopback. • Execute Punch through sequence - punches through repeaters without checking returned codes. • Verbose Display - detailed latching confirmation information. • Check Return Codes - confirms latching loopback by verifying returned codes.
BERT	This is useful to test for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.
Seconds in Test	This read-only count represents the number of seconds the data module was in test.
Local Error Seconds	This read-only count represents the number of local errored seconds that occurred while the data module was in test.
Remote Error Seconds	This read-only count represents the number of remote errored seconds that occurred while the data module was in test.
Clear Count	The C command will zero all local and remote errored seconds.
Insert Errors	The E command will generate 1 or 2 errored seconds for either 2047, ones, or zeros BERT pattern.
INDICATORS	
DCD	If this indicator is On, your Test Access Module is asserting the Data Carrier Detect lead on its serial port interface.
DTR	If this indicator is On, your Test Access Module is detecting a Data Terminal Ready input to its serial port interface from the connected test set or DTE.
DSR	If this indicator is On, your Test Access Module is asserting the Data Set Ready lead on its serial port interface.

Where supported, AS4000 products implement a bi-directional V.54 loopback.

Figure 8-4 V.54 Loopback



The above diagram refers to local and remote loops on the **Diagnostics Menu** (see following pages).

Utilities Menu

A brief description of each of the menus is provided in [Table 8-3](#). In addition, a tree of the **Utilities Menu** and its submenus are displayed on the following page

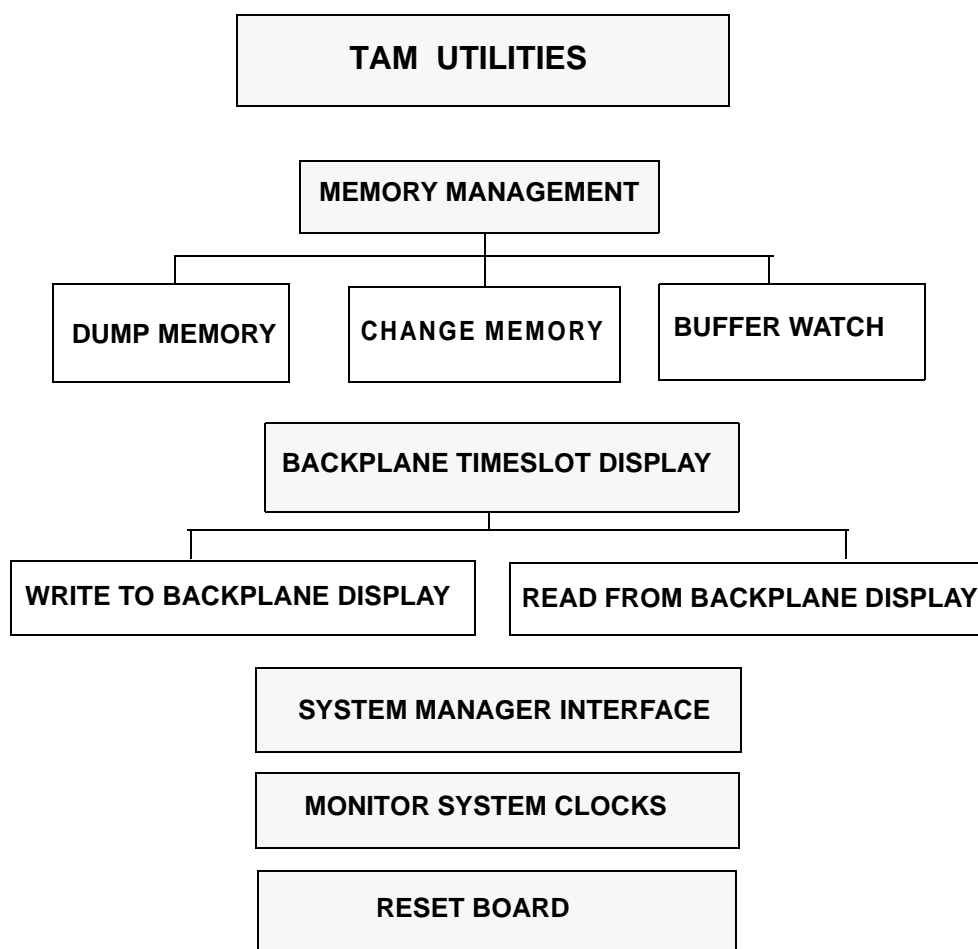
Table 8-3 Utilities Menu

Memory Management	Used for debug only, watches CPU memory utilization.
Backplane Timeslot Display	Used for debug only, views or modifies connections across the AS4000 shelf midplane. Do not access these menus unless directed to do so by Verilink Tech Support.
System Manager Interface	Used for debug only, provides information on the connection mappings and the AS4000 configuration file system.
Monitor System Clocks	Used for debug only, provides a screen with information about the current status of the configured and available clock sources.
Reset Boards	Resets the TAM card.

Figure 8-5 Test Access Module Utilities Menu

Verilink Corporation	AS4000 - Test Access	Slot: 11	Help = [?]
<p style="text-align: center;">Utilities -----</p> <p>Memory Management Backplane Timeslot Display System Manager Interface Monitor System Clocks Reset Board</p>			
<p>Navigate menu = [Space/Backspace] Change parameter = [Return/'B'] Exit/abort edits = ['X'/Esc]</p>			

Figure 8-6 TAM Utilities Menu



About Menu

Figure 8-7 About Menu

Verilink Corporation	AS4000 - Test Access	Slot: 11	Help = [?]
<p>TAM - Test Access Module</p> <p>-----</p>			
<p>Version.....: TAM 0202</p> <p>Release Date.....: Jan. 13, 1999</p> <p>Checksum.....: CC48</p> <p>Xilinx Version...: tamv1r58</p>			
<p>Navigate menu = [Space/Backspace]</p> <p>Change parameter = [Return/' B']</p> <p>Exit/abort edits = [' X' /Esc]</p>			

Table 8-4 About Menu.

Version	This is the software version currently in the TAM's flash memory.
Release Date	The date of engineering release to production.
Checksum	The sum of all bytes in the TAM's flash memory at power up.
XILINX Version	The hardware version of downloadable, programmable devices.

Chapter 9

Octal DS-1/E1

The Octal DS-1/E1 module manages and combines up to 8 T1 or 8 E1 data streams (voice, data and video applications). Each T1/E1 link can be configured differently or the same as the others.

The Octal DS-1/E1 module presents console menus in which it is called a T1/E1 module. In this document the AS4000 Octal DS-1/E1 module is always called a DS-1/E1 module.

NOTE: *To meet FCC EMI and RFI regulations, a shielded twisted pair cable must be used. The drain wire must be attached to one of the two ground lugs available on the rear bezel. The drain wire connection must be kept as short as possible. In addition, the rear card must be secured to the chassis by firmly tightening the card using the screws on the bezel.*

Before You Begin

In order to view the menus associated with the Octal DS-1/E1 module, you must perform the following:

1. Place the Octal DS-1/E1 card in a slot in the equipment nest.
2. Configure the slot for module type: Octal T1/E1.
3. Confirm that the Configured Type and Actual Type noted on the **Node Summary Menu** is Octal T1/E1.

Figure 9-1 Node Summary Menu

```

Verilink Corporation
AS4011 - System Manager
Standby SMC not present
Help = [?]

Node Summary Menu

Slot#   Configured Type   Actual Type   Status
-----
01)     T3                T3           OK        Clock Source
02)     Quad High Speed    Quad High Speed  OK
03)     Octal T1/E1        Octal T1/E1    Alarm *
04)     Quad T1            Quad T1        Alarm *
05)     Quad T1            Quad T1        OK *
06)     Quad T1            Quad T1        OK *
07)     Quad T1            Quad T1        Rear Card Missing
08)     Octal Voice        Octal Voice    OK
09)     Quad OCU           Quad OCU       OK
10)     ----              ----          Not Present
11)     Test Access        Test Access    OK
SMCA)   System Manager     System Manager  Not Present
SMCB)   System Manager     System Manager  On Line

[C]hange slot configuration      [D]elete slot configuration

```

NOTE: If the slot does not show a Configured Type, refer to “[Slot Configuration](#)” in Chapter 4 of this manual.

To access the **User Profile Manager Menu**, from the Octal T1/E1 Main Menu, select System Configuration, then select Users Menu. The **Users Profile Manager Menu** displays. To configure the Users Profile Manager for security purposes, navigate to the **Users Menu**.

NOTE: This section is written from the perspective of the *ADMINISTRATOR* who employs the User Profile Manager Menu to add, change, or delete user information. Refer to “[System Menus](#)” in Chapter 4 for an explanation of security levels.

Octal DS-1/E1 Main Menu

The **Octal T1/E1 Main Menu** provides options that enable you to configure the Octal DS-1/E1 module, run diagnostics, access utilities, and display module identification.

Figure 9-2 Octal DS1/E1 Main Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
<p>Main Menu</p> <p>-----</p> <p>Configuration</p> <p>Diagnostics</p> <p>Utilities</p> <p>About</p>			

Configuring the Octal DS-1/E1 Module Parameters

The Octal DS-1/E1 configuration files are stored on the System Manager Card. When an Octal DS-1/E1 card is replaced, the old configuration is preserved.

To configure the Octal DS-1/E1 module's parameters:

1. From the **Main Menu**, select **Node Summary**.
2. Select a slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Configuration. The **Links Configuration Menu** appears. See [Figure 9-3](#).

Figure 9-3 Links Configuration Menu

VeriLink Corporation		AS4000 - T1/E1			Slot: 03		Help = [?]	
Links Configuration								

Link Name		Framing		FDL	LH/LBO	Network Loop	Yellow Alarm	Idle Code
-----		-----		-----	-----	-----	-----	-----
01	37DFRC7148611	T1	ESF B8ZS Clear	54016	0.0db	Enable	No	Busy
02	54DHEC7560114	T1	ESF B8ZS Clear	54016	0.0db	Enable	Yes	Busy
03	32DHEE5401611	T1	D4 AMI 62411		0.0db	Enable	Yes	Idle
04	38DABR7148610	T1	ESF B8ZS Clear	T1.403	0.0db	Disable	Yes	Idle
05	36DMRA5411735	T1	ESF B8ZS Clear	T1.403	0.0db	Enable	Yes	Busy
06	54DHEC4156877	T1	ESF B8ZS Clear	54016	0.0db	Disable	Yes	Busy
07	54DHEC34771541	T1	ESF AMI 62411	54016	0.0db	Enable	No	Busy
08	Circuit Number	Out Of Service						
LH - Long haul		LBO - Line build out [T1 only]			FDL - facility data link			

- To configure all parameters for each link, place your cursor on a link number field and press ENTER. The following submenu appears.

Figure 9-4 Links Configuration Submenu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
Link Configuration			

Link Nbr.....:	4		
Name.....:	38DABR7148610		
Status.....:	In Service		
LineType.....:	T1 ESF B8ZS Clear		
Network Loop.:	Disabled		
Yellow alarm.:	Yes		
Unused DS0's.:	Idle		
ESF format...:	T1.403		
LBO.....:	0.0db <> Long Haul		

The field entries on this screen are described in [Table 9-1](#).

- To save changes, type "X".
- When prompted: Update Configuration? Are you sure (Y/N)? Type "Y".

Table 9-1 Link Configuration Fields

Field	Description
Link Number	Displays the link number selected from the Link Configuration menu.
Name (text field)	This is a user-defined field. Any name up to 20 characters in length can be entered to identify each port on the Octal DS-1/E1. Some users find it beneficial to use circuit numbers to name the ports.
Status (option field)	<p>This field determines the status of the port. The status will either be In Service or Out of Service.</p> <ul style="list-style-type: none"> • In Service - an operational link that shows a valid configuration has been set up. When the port is In Service you can run Diagnostics. • Out of Service - a mechanism to avoid getting alarms. Out of Service also causes the port to be inactive and you cannot run Diagnostics.
Line Type (option field)	<p>This field determines the type of framing used on the line. The line types are as follows:</p> <ol style="list-style-type: none"> 1. Short Haul and Long Haul line interface options are available with E1 line types (i.e., how long the line is coming from your facility). <ul style="list-style-type: none"> • E1 • E1-CRC • E1-CAS • E1-CAS-CRC • E1-Unframed 2. An LBO option field is available with T1 line types. <ul style="list-style-type: none"> • T1-ESF AMI 62411 • T1-ESF B8ZS Clear • T1 D4 B8ZS Clear • T1 D4 AMI 62411 • T1 over E1
Network Loop (option field)	This entry determines the module's ability to respond to loop diagnostic commands received from the network supplier. (Enabled/Disabled) The default setting is Disabled.

Table 9-2 Link Configuration Fields (continued)

Field	Description
Yellow Alarm (option field)	Yes causes the module to discard data and send a yellow alarm if it is in a red alarm condition after a three-second period. Yes must be chosen if the network supplier is a common carrier, such as a telephone company.
Unused DS0s (option field)	This selection determines whether the data that will be transmitted over the unused DS0s will be Idle or Busy.
ESF Format (T1 only) (option field)	This entry describes the types of ESF network commands that the module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.
Short Haul	Physical interface selection for co-located E1 equipment.
Long Haul	Physical interface selection for long connection to E1 equipment.
LBO (T1 option field)	Long Haul = 0.0db through 22.5db (options: 0.0db, 7.5db, 15.0db, 22.5db) Short Haul = 0-133 Ft. through 655 Ft. (options: 0-133 Ft., 133-266 Ft., 266-399 Ft., 399-533 Ft., 533-655 Ft.) Long haul/short haul designation for E1 is defined by authentication of signal presented to the receiving circuitry, not by cable length. Short haul is defined as 0 to -6db, long haul as 0 to -34db. This loss is related to cable type and cable length.

Octal DS-1/E1 Diagnostics

- Line Diagnostics Center
- Backplane Check
- System Status

Line Diagnostics Center

To run Diagnostics on the Octal DS-1/E1 Diagnostics module:

1. From the **Main Menu**, select Node Summary.
2. Select a slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Diagnostics.
4. From the **Diagnostics Menu**, select Line Diagnostics Center. See [Figure 9-5](#).

Figure 9-5 Diagnostics Menu

```

VeriLink Corporation          AS4000 - T1/E1          Slot: 03      Help = [?]

                                Diagnostic Menu
                                -----

                                Line Diagnostics Center
                                Backplane Check
                                System Status

```

Upon selecting the **Line Diagnostics Center**, the **Diagnostics Manager Menu** appears.

Figure 9-6 Diagnostics Manager Menu

```

VeriLink Corporation          AS4000 - T1/E1          Slot: 03      Help = [?]

                                Diagnostics Manager
                                -----

                                Link Name      State      Errored Link      Bkpl n      Test      Local
                                Seconds Loop      Loop      Bert      Duration      Errors
                                -----
037DFRC71486 *ERROR*  40905 Off      Off      Off      0      0
054DHEC75601 *ERROR*  40938 Off      Off      Off      0      0
032DHEE54016 *ERROR*  40839 Off      Off      Off      0      0
038DABR71486 *ERROR*  40788 Off      Off      Off      0      0
036DMRA54117 *ERROR*  40745 Off      Off      Off      0      0
054DHEC41568 *ERROR*  40703 Off      Off      Off      0      0
054DHEC34771 *ERROR*  40677 Off      Off      Off      0      0
Circuit Num Inactive 0      Off      Off      Off      0      0

[B]ert [L]oop [E]xpose [C]lear Error Counters
ESF [S]tatistics ESF [R]egisters [G]. 826

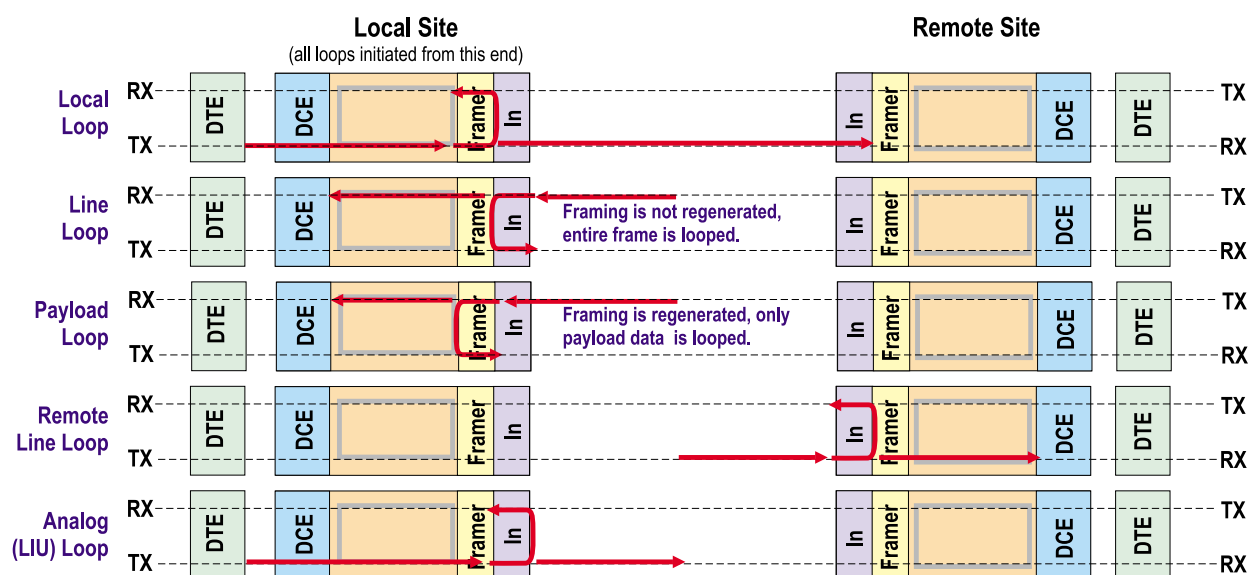
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBi t
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

```

Loopback Types

Figure [Figure 9-7](#) illustrates the loopbacks supported by the Octal DS1/E1 module.

Figure 9-7 Octal DS-1/E1 Loops



NOTE: The Payload Loop is different than the Line Loop in that it only loops the data (payload), and the framing is regenerated.

The field entry descriptions and how to access BERT, Loop, Expose, Statistics, and Register screens are described on the following pages.

The Diagnostics Manager fields are described in [Figure 9-3](#).

Table 9-3 Diagnostics Manager Fields

Link Name	The name given by the user at the Configuration screen.
State	Active (in service) - displays an <i>OK</i> or <i>*ERROR*</i> state; Inactive (out of service).
Errored Seconds	This is an indication of the number of seconds with errors (i.e., something went wrong on the line).
Link Loop	Indicates what type of loopback is active on the link, if any.
Backplane Loop	Loops a data connection from the link back to the link via the backplane. Since this incorporates most of the card's hardware and software, this is a useful test to check card integrity. Note that a user connection must already be in place prior to invoking this loopback.
Bert	When On, indicates the selected pseudo-random bit error rate test pattern.
Test Duration	Once the BERT test is started, the length of the test is measured (seconds).
Local Errors	Displays the number of errors that occurred during the test.

Hot Keys The following hot keys invoke additional screens and/or functions. They are described on the following pages.

Table 9-4 Hot Keys

"[B]ert"	Pseudo-random bit error test patterns
"[L]oop"	Allows you to set different loopbacks
"[E]xpose"	Displays the status of the line
[C]lear Error Counters	Clears all errored seconds and BERT indicators
"ESF [S]tatistics"	ESF Statistics Menu
"ESF [R]egisters"	The ESF Registers Menu gives the same information as the ESF Statistics Menu, but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.
"[G].826"	A status screen that displays the performance statistics of the link for the duration (set interval of time) the link is up and running.
"Keys 1 thru 9"	Use keys 1 through 9 to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side.

[B]ert The **BERT Select Screen** has a list of several test patterns.

Figure 9-8 Diagnostics BERT Select Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
BERT Select -----			
Link Number...: 1			
Link Name....: 37DFRC7148611			
Current BERT.: Off			
New BERT.....: Off			
Available Bit Error Tests (BERTs) -----			
[0] ff	[0] All-zeros (0x00)		
[1] All-Ones (0xFF)			
[2] Unframed 2047	[B] Framed 2047		
[3] Unframed 2^15	[C] Framed 2^15		
[4] Unframed 2^20	[D] Framed 2^20		
[5] Unframed 2^23	[E] Framed 2^23		
[6] Unframed 2^11 - 7 0's limits	[F] Framed 2^11 - 7 0's limits		
[7] Unframed 2^15 - 7 0's limits	[G] Framed 2^15 - 7 0's limits		
[8] Unframed QRSS	[H] Framed QRSS		
[9] Unframed 2^23 - 14 0's limits	[I] Framed 2^23 - 14 0's limits		

Procedure

To access the BERT Select menu and run a test pattern:

1. Place your cursor on an *Active* link in the **Diagnostics Manager Menu** and type "B". A new menu appears (Figure 9-6).
2. Next, place your cursor in the **New BERT** field and press ENTER. The available Bit Error Tests are displayed on the screen.
3. Upon selecting the test pattern, type "X". A new message appears: Start new test? Are you sure (Y/N)?

[L]oop The **Loop Select Menu** has a list of several loopback options, including Local, Line, Analog, Remote, and Payload.

Figure 9-9 Loop Select Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
Link: 1			
Loop Select Screen			

NI Loop Type.: Off			
Backplane Loop: Off			
NI Loop Type : [O]ff [L]ocal [L]ine [A]nalog [R]emote [P]ayload			
Backplane Loop: [T]oggle			

Procedure

To access the Loop Select menu and run an NI loop:

1. Place your cursor on any *Active* link in the **Diagnostics Manager Menu** and type "L".
2. A new menu appears, see above. Type one of the corresponding letters below to run a specific NI loop.
 - **[L]** - for a local loop
 - **[n]** - for a line loop
 - **[A]** - for an analog loop
 - **[R]** - for a remote loop
 - **[P]** - for a payload loop
3. Designed to check the integrity of the backplane, toggle the Backplane Loop On or Off.

[E]xpose The **Expose Menu** displays the real-time or current status of the DS-1/E1 link.

Figure 9-10 Expose Menu

```

VeriLink Corporation          AS4000 - T1/E1          Slot: 03      Help = [?]

                                T1/E1 Link Status
                                -----
Link#: 1      Name: 37DFRC7148611
----- State  ErroredSec
Red Alarm    : On      41646   Crc Errors.....: 0
Yellow Alarm : Off      0      Bpv Errors.....: 0
Loss Of Signal: On     41646   Frame Bit Errors...: 0
AIS Indication: Off      0
Out Of Frame : On     41646
SEF Indication: On     41646
Transmit Slip: Off      0
Receive Slip : Off     36503

[C]lear Counters  ESF [S]tatistics  ESF [R]egisters  [G].826 Re[I]nitiaIze
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Mul ti frame  [2]Mul ti frame          [3]PRBS          [4]FBI t
[5]Frame Alignment  [6]Line Code Violation  [7]Bit Slip  [8]CRC  [9] All

```

Procedure

To access the Expose screen and view the status of the DS-1/E1 link:

1. Place your cursor on any *Active* link in the **Diagnostics Manager Menu** and type "E". A new menu appears (Figure 9-10).

Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF, E1-CRC, or E1-CRC-CAS).

An error-free link will display zeros in all fields.

Keys 1 thru 9

Use keys 1 through 9 to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side. Table 9-5 describes each error insertion option.

Table 9-5 Insert Error Options 1 - 9

CAS Multiframe	CRC-6
Multiframe	
PRBS	
FBit	
Frame Alignment	
Line Code Violation	
Bit Slip	
CRC	
All	

ESF [S]tatistics The **ESF Statistics Menu** enables you to access both current and 24-hour ESF Statistics. The Curr (current statistics) column displays the counts for the current time interval (maximum fifteen minutes). The 24 Hr (24-hour statistics) column displays the counts for the preceding 24-hour period.

Figure 9-11 ESF Statistics Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
ESF Statistics For Port#: 1			
Register	Curr	24 Hr	

Errored seconds.....	0	0	
Failed seconds (UAS)....	880	19964	
Severely errored seconds:	0	0	
Bursty errored seconds..	0	0	
Loss of frame count.....	0	0	
Time In Interval.....	880		
# Valid intervals.....	191		
ESF status.....	00000000		

To access the ESF Statistics screen:

1. Place your cursor on any *Active* link in the **Diagnostics Manager Menu** and type "S". A new menu appears ([Figure 9-11](#)).

The ESF Statistics fields are described in [Table 9-6](#).

Table 9-6 ESF Statistics Field Descriptions

Errored secs	The occurrence of a Loss of Frame or a CRC-6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.
Failed secs (UAS)	Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.
Severely errored secs	A one-second period in which three hundred twenty (320) or more CRC-6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.
Bursty errored secs	A one-second period in which more than one but less than 320 CRC-6 errors have occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.
Loss of frame count	A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in interval	A timer that tracks the number of seconds in one 15-minute interval.
# of Valid intervals	A counter that tracks the total number of 15-minute intervals in a 24-hour period (up to 96).
ESF status	<p>This field defines the status of the T1 line. The status is defined by an eight-digit number that is described below:</p> <p style="text-align: center;">FU0000LO</p> <ul style="list-style-type: none"> Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true. Digit #2 - "U" or "0" where "U" indicates an unavailable signal state. Digits #3 through #6 and #8 are always "0." Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

ESF [R]egisters The **ESF Registers Menu** gives the same information as the ESF Statistics, but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period. The ESF Registers Menu for the selected port is shown in [Figure 9-12](#).

Figure 9-12 ESF Registers Menu

VeriLink Corporation					AS4000 - T1/E1					Slot: 03					Help = [?]				
ESF registers For Port#: 1																			
INT	ES	FS	SES	BES	INT	ES	FS	SES	BES	INT	ES	FS	SES	BES					

01.	000	900	000	000	17.	000	900	000	000	33.	000	900	000	000					
02.	000	900	000	000	18.	000	900	000	000	34.	000	900	000	000					
03.	000	900	000	000	19.	000	900	000	000	35.	000	900	000	000					
04.	000	900	000	000	20.	000	900	000	000	36.	000	900	000	000					
05.	000	900	000	000	21.	000	900	000	000	37.	000	900	000	000					
06.	000	900	000	000	22.	000	900	000	000	38.	000	900	000	000					
07.	000	900	000	000	23.	000	900	000	000	39.	000	900	000	000					
08.	000	900	000	000	24.	000	900	000	000	40.	000	900	000	000					
09.	000	900	000	000	25.	000	900	000	000	41.	000	900	000	000					
10.	000	900	000	000	26.	000	900	000	000	42.	000	900	000	000					
11.	000	900	000	000	27.	000	900	000	000	43.	000	900	000	000					
12.	000	900	000	000	28.	000	900	000	000	44.	000	900	000	000					
13.	000	900	000	000	29.	000	900	000	000	45.	000	900	000	000					
14.	000	900	000	000	30.	000	900	000	000	46.	000	900	000	000					
15.	000	900	000	000	31.	000	900	000	000	47.	000	900	000	000					
16.	000	900	000	000	32.	000	900	000	000	48.	000	900	000	000					
[N]ext Page																			

Procedure

To access the ESF Registers screen:

1. Place your cursor on any *Active* link in the **Diagnostics Manager Menu** and type "R". A new menu appears (Figure 9-12).

The ESF Register fields are described in Table 9-7.

Table 9-7 ESF Register Field Descriptions

Errored Seconds (ES)	The occurrence of a Loss of Frame or a CRC-6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.
Failed Seconds (FS)	Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.
Severely Errored Seconds (SES)	A one-second period in which three hundred twenty (320) or more CRC-6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.
Bursty Errored Seconds (BES)	A one-second period in which more than one but less than 320 CRC-6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

[G].826 The **G.826 Statistics** screen displays the performance statistics of the link for the duration of time the link is up and running.

Figure 9-13 G.826 Statistics Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
<p style="text-align: center;">G. 826 Statistics -----</p> <p>Link#: 1</p> <p>Total Time.....: 173138</p> <p>Errored Seconds.....: 0</p> <p>Errored Free Seconds.....: 173138</p> <p>Severely Errored Seconds.....: 0</p> <p>Consecutive Severely Errored Seconds: 0</p> <p>Consecutive Errored FreeSeconds.....: 173138</p> <p>Background Errored Seconds.....: 0</p> <p>Errored Seconds Ratio.....: 0.0000</p> <p>Severely Errored Seconds Ratio.....: 0.0000</p> <p>Background Errored Seconds Ratio....: 0.0000</p> <p>[C]lear Counters</p>			

Procedure

To access the G.826 Statistics screen:

1. Place your cursor on any *Active* link in the **Diagnostics Manager Menu** and type "G". A new menu appears ([Figure 9-8](#)).

The G.826 Statistics fields are described in [Table 9-8](#). Refer to the *ITU-T Standardized Specifications*, dated 08/96, for a more detailed description of the G.826 statistics.

Table 9-8 G.826 Statistics Field Descriptions

Total Time	The duration of time the link is up and running in seconds.
Errored Seconds	A one-second period with one or more errored blocks or at least one defect.
Errored Free Seconds	A one-second period of time the link was error free.
Severely Errored Seconds	A subset of ES, SES is a one second period which contains $\geq 30\%$ errored blocks or at least one defect.
Consecutive Severely Errored Seconds	A continuous occurrence of SES, in one second intervals, which contains $\geq 30\%$ errored blocks or at least one defect.
Consecutive Errored Free Seconds	A display of consecutive one-second period intervals that did not have defects or errors on the link.
Background Errored Seconds	A one-second period with one or more errored blocks or at least one defect not occurring as part of the ES.
Errored Seconds Ratio	The ratio of ES to total seconds in available time during a fixed measurement interval.
Severely Errored Seconds Ratio	The ratio of SES to total seconds in available time during a fixed measurement interval.
Background Errored Seconds Ratio	The ratio of background block errors to total blocks of available time during a fixed measurement interval. The count of total blocks excludes all blocks during SES.

Backplane Check To monitor the integrity of the backplane on the Octal DS-1/E1 Diagnostics module:

1. From the **Main Menu**, select Node Summary.
2. Select a slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Diagnostics.
4. From the **Diagnostics menu**, select Backplane Check.

Figure 9-14 Monitor Backplane Integrity Menu

VeriLink Corporation		AS4000 - T1/E1			Slot: 03	Help = [?]
Monitor Backplane Integrity						
Slot#	Slot # Address	Slot # Received	Pattern Address	Pattern Received	Status (Ignore for QHS)	

01	0x00E02807	0F	0x00E02808	0F		
02	0x00E02809	0F	0x00E0280A	0F		
03	0x00E0280B	03	0x00E0280C	0C	... OK ...	
04	0x00E0280D	04	0x00E0280E	01	... OK ...	
05	0x00E0280F	05	0x00E02810	08	... OK ...	
06	0x00E02811	06	0x00E02812	0E	... OK ...	
07	0x00E02813	07	0x00E02814	05	... OK ...	
08	0x00E02815	08	0x00E02816	09	... OK ...	
09	0x00E02817	09	0x00E02818	06	... OK ...	
10	0x00E02819	0E	0x00E0281A	0E		
11	0x00E0281B	0E	0x00E0281C	0E		

This screen is intended as a diagnostic tool for the manufacturer. It displays the status of the AS4000 backplane.

System Status

To check the System Status on the Octal DS-1/E1 Diagnostics module:

1. From the **Main Menu**, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Diagnostics.
4. From the **Diagnostics Menu**, select System Status.

Figure 9-15 Monitor Backplane Status Menu

VeriLink Corporation

AS4000 - T1/E1

Slot: 03

Help = [?]

Monitor Backplane Status

Description	Transitions

Current Backplane Status.....: On the Bus	
Card Service Status.....: In Service	
System Ready To Go In Service.....: Yes	9
System Clock Status.....: Present	0
Frame SYNC Signal Status.....: Present	0
Too Many Backplane Time Slots ON.....: No	0
Receive TSFM Map.....: Yes	9
Hardware Access to Memory.....: Enable	

Card In Service = [1]

Card Out Of Service = [0]

Reset Counters = [R]

NOTE: The fields shown in this menu are the default settings and should not be accessed or configured unless you are established as a high level user (e.g., Developer); they are for debugging purposes only. It is strongly suggested that you do not tamper with these fields unless prompted to do so by a Verilink Technical Assistance Center Representative.

The Monitor Backplane Status fields are described in [Table 9-9](#).

Table 9-9 Monitor Backplane Status Field Descriptions

Current Backplane Status	On-line/Off-line status that enables the card to communicate with the AS4000 Backplane.
Card Service Status	Shows whether the board is in or out of service.
System Ready To Go In Service	Shows whether the card is good or bad.
System Clock Status	A watchdog timer that monitors the integrity of the backplane clock. This clock is critical to backplane operation.
Frame SYNC Signal Status	A watchdog timer that monitors the integrity of the sync signal that coordinates data flow on the backplane. Critical to backplane operation.
Too Many Backplane Time Slots ON	A watchdog timer that monitors access to the backplane by this card. Protects the system from a faulty card corrupting data on the backplane.

Receive TSFM Map	Signals the hardware when to use the backplane.
Hardware Access to Memory	A way for the software to disable the memory for testing purposes.
Transitions	Displays a count of activities.

The following hot keys invoke additional screens and/or functions:

- **[I]** = Card In Service - places the card in service
- **[O]** = Card Out Of Service - places the card out of service
- **[R]** = Reset Counters - resets the transitions or activity counter

Octal DS-1/E1 Utilities

To access the Octal DS-1/E1 Utilities, follow these steps:

1. From the **AS4000 Main Menu**, select Node Summary.
2. Select a slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Utilities.

Figure 9-16 Utilities Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
<p style="text-align: center;">Utilities Menu -----</p> <p style="text-align: center;">System Manager Interface Reset Device Board Status: In Service</p>			

System Manager Interface Statistics

To view System Manager Interface Statistics, such as map checksum or byte count, follow these steps:

1. From the **AS4000 Main Menu**, select Node Summary.
2. Select a Slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Utilities.
4. From the **Utilities Menu**, select System Manager Interface Status.

Figure 9-17 System Manager Interface Status

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
System Manager Interface Status			

Configuration Map sequence number.....: 18			
Downloaded Config Map sequence number...: 18			
Configuration Map Checksum.....: 0			
Configuration Map Byte Count.....: 0			
Number of Configuration Map changes.....: 2			
Number of Configuration Maps downloads...: 1			
System Manager Level Identifier.....: 600			
System Manager Id.....: 61			
System Files sequence number.....: 0			

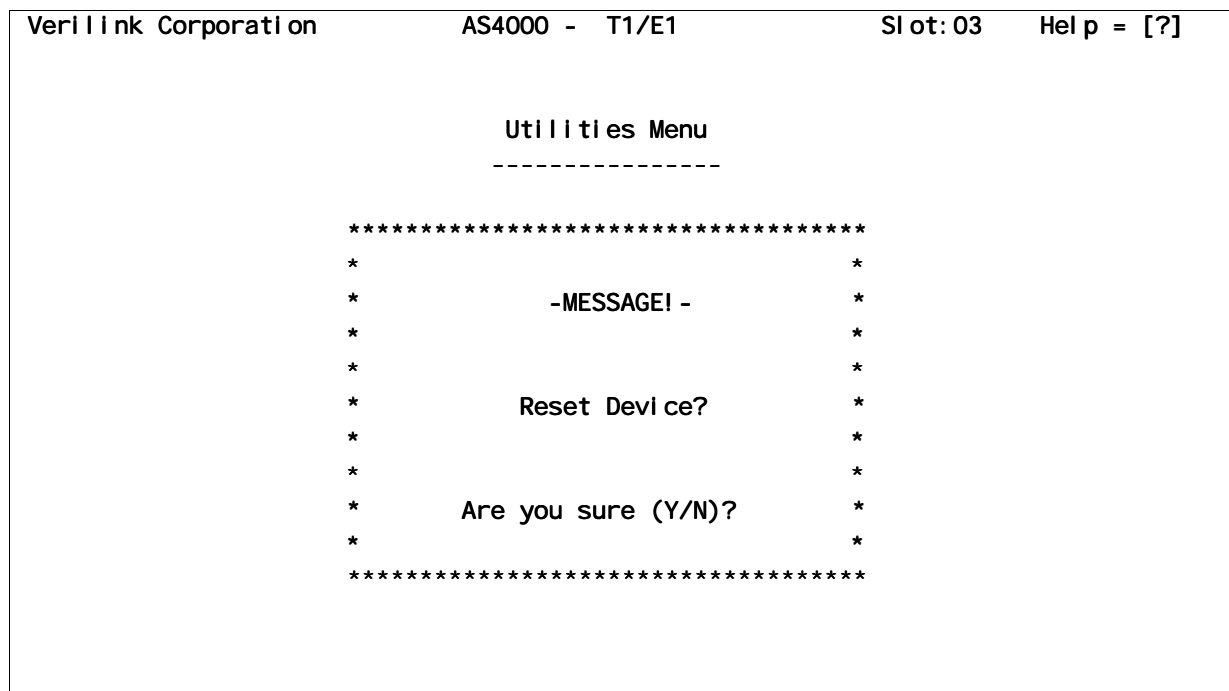
The System Manager Interface Status is a view-only screen that shows the communications between the SMC board and all of the loaded application modules. This screen is generally used for high level technical troubleshooting at the system programming level.

Reset Device Reset Device causes the card to initialize in the same manner as power up. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

To Reset the device, follow these steps:

1. From the **AS4000 Main Menu**, select Node Summary.
2. Select a slot that has been configured for Octal T1/E1.
3. From the **Octal T1/E1 Main Menu**, select Utilities.
4. From the **Utilities Menu**, select Reset Device.

Figure 9-18 Reset Device



5. Upon resetting the device, type "X". A new message appears:
Reset Device? Are you sure (Y/N)?

About Menu

- Procedure** To display identification information for the Octal DS-1/E1 module:
1. From the **Main Menu**, select Node Summary.
 2. Select a Slot that has been configured for Octal T1/E1.
 3. From the **Octal T1/E1 Main Menu**, select About.

Figure 9-19 About Menu

VeriLink Corporation	AS4000 - T1/E1	Slot: 03	Help = [?]
About -----			
Version.....: 01.00f Release Date.....: June 17, 1999 Checksum.....: 6479 Xilinx Version...: wb_xlx14 Front Card Type...: Octal T1/E1 Front Card Rev...: 0 Rear Card Type...: Octal T1E1 120 OHM Rear Card Rev....: 1			

The About fields are described in [Table 9-10](#).

Table 9-10 About Field Descriptions

Version	This is the software version currently in the Octal DS-1/E1's flash memory.
Release Date	The engineering release to production date.
Checksum	The sum of all bytes in the Octal DS-1/E1 card's flash memory at power up.
XILINX Version	The hardware version of downloadable, programmable devices.
Front Card Type	Displays the type of the front card in the slot.
Front Card Rev	Displays the front card's revision level.
Rear Card Type	Displays the type of rear card in the slot.
Rear Card Rev	Displays the rear card's revision level.

Chapter 10

Quad OCU

The Quad OCU (Office Channel Unit) module supports up to 4 DDS (Digital Dataphone Service) data streams at rates of 56 Kbit/s or 64 Kbit/s each. It is designed for direct connection to DDS 4-wire local loops which are typically terminated with a DDS DSU at a remote site.

Before You Begin

In order to view the menus associated with the Quad OCU module, you must perform the following:

1. Place the Quad OCU card in a slot in the equipment nest.
2. Configure the slot for module type: Quad OCU.
3. Confirm that the Configured Type and Actual Type noted on the **Node Summary Menu** is Quad OCU.

Figure 10-1 Node Summary Menu

```

Verilink Corporation
AS4011 - System Manager
Help = [?]

Node Summary Menu

Slot#   Configured Type   Actual Type   Status
-----
01)     T3              T3           OK        Clock Source
02)     Quad High Speed   Quad High Speed   OK
03)     ----              ----          Not Present
04)     Quad T1           Quad T1        Rear Card Missing
05)     Quad T1           Quad T1        OK *
06)     Quad T1           Quad T1        OK *
07)     Quad T1           Quad T1        Rear Card Missing
08)     Quad T1           ----          Not Present
09)     Quad OCU          Quad OCU       OK
10)     ----              ----          Not Present
11)     Test Access       Test Access    OK
SMCA)   System Manager    Not Present
SMCB)   System Manager    On Line

[C]hange slot configuration   [D]elete slot configuration

```

NOTE: If the slot does not show a Configured Type, refer to “[Slot Configuration](#)” in Chapter 4 of this manual.

This section is written from the perspective of the ADMINISTRATOR who employs the User Profile Manager Menu to add, change, or delete user information. Refer to “[System Menus](#)” in Chapter 4 for an explanation of security levels.

Quad OCU Main Menu

The **Quad OCU Main Menu** provides options that enable you to configure the Quad OCU module, run diagnostics, access utilities, and display module identification.

Figure 10-2 Quad OCU Main Menu

VeriLink Corporation	AS4000 -Quad OCU	Slot: 9 Help = [?]
OCU Main Menu		
Configuration		
Diagnostics		
Utilities		
About		

Configuring the Quad OCU

The Quad OCU configuration files are stored on the System Manager Card. When a Quad OCU card is replaced, the old configuration is preserved.

To configure the Quad OCU module's parameters:

1. From the **Main Menu**, select **Node Summary**.
2. Select a slot which contains a Quad OCU.
3. From the **Quad OCU Main Menu**, select Configuration. The **Configuration Menu** appears. See [Figure 10-3](#).

Figure 10-3 Configuration Menu

VeriLink Corporation		AS4000 -Quad OCU		Slot: 9 Help = [?]	
Configuration Manager					
			Clear Channel	Customer Control	
Port	Name	Data Rate	Capability	Loopback	Status

01	Circuit ID #	56 kbps	No	Yes	In Service
02	Circuit ID #	56 kbps	No	Yes	In Service
03	Circuit ID #	56 kbps	No	Yes	In Service
04	Circuit ID #	56 kbps	No	Yes	In Service

- To configure a port, place your cursor on a port number field and press ENTER. The following submenu appears.

Figure 10-4 Port Configuration Menu

VeriLink Corporation	AS4000 -Quad OCU	Slot: 9	Help = [?]
Configuration			
Port.....: 1			
Name.....: Circuit ID #			
Data Rate.....: 56 kbps			
Clear Channel Capability [valid only for 64 kbps]...: No			
Customer Control Loopback[valid only for 56 kbps]...: Yes			
Status.....: In Service			

- To save changes, type "X".
- When prompted: **Update Configuration? Are you sure (Y/N)?**
Type "Y".

The **Port Configuration Menu** fields are described in [Table 10-1](#).

Table 10-1 Port Configuration Fields

Field	Description
Port	Refers to the physical port of the Quad OCU rear module, 1 through 4.
Name (text field)	This is a user-defined field. Any name up to 20 characters in length can be entered to identify each port on the Quad OCU. Some users find it beneficial to use telephone carrier circuit ID numbers to name the ports.
Data Rate (option field)	This field determines the speed of the port. 56K—this widely used data rate consumes one DS0 per circuit but assures ones-density by asserting one bit out of 8 as a one. 64K—this less frequently available service, sometimes called clear channel, allows the user the full bandwidth of a DS0.
Clear Channel Capability (option field)	This field enables the use of a full 64 Kbit/s data stream when the OCU port is connected to a DDS Type II clear channel circuit. This feature is not applicable to the more widely used 56 Kbit/s DDS circuit. Select Yes only for 64 Kbit/s DDS.
Customer Control Loopback (option field)	This entry determines the module's ability to respond to loop diagnostic commands received from the network supplier. (Enabled/Disabled) The default setting is Disabled.

Quad OCU Diagnostics

Diagnostics are used for troubleshooting problems or for verifying circuit and product functionality.

Line Diagnostics Center

To run Diagnostics on the Quad OCU Diagnostics module:

1. From the AS4000 **Main Menu**, select Node Summary.
2. Select a slot that contains a Quad OCU module.
3. From the Quad OCU **Main Menu**, select Diagnostics. The **Diagnostics Menu** appears, see [Figure 10-5](#).

Figure 10-5 Diagnostics Menu

VeriLink Corporation	AS4000 -Quad OCU	Slot: 9 Help = [?]
Diagnostics Menu ----- Line Diagnostics Center		

4. From the **Diagnostics Menu**, select Line Diagnostics Center. See [Figure 10-6](#).

Figure 10-6 Line Diagnostics Menu

VeriLink Corporation		AS4000 -Quad OCU		Slot: 9 Help = [?]	
Diagnostic Monitor					
Port.....: #1	#2	#3	#4		
Name.....: Circuit ID #	Circuit ID #	Circuit ID #	Circuit ID #		
Port Loop.....: Off	Off	Line	Local Digital		
Backplane Loop: Off	Off	Off	Off		
Bert.....: Off	Off	Off	Off		
Secs. In Test...: 0	0	0	0		
Local Errors...: 0	0	0	0		
Remote Error...: 0	0	0	0		
State.....: LostDDS Carrier	LostDDS Carrier	LostDDS Carrier	LostDDS Carrier		
Bipolar Error.: Yes- 16196	Yes- 16199	Yes- 16220	No - 13814		
Loss of Frame.: No - 0	No - 0	No - 0	No - 0		
LineLoss db/km: 50.5/8.5	50.5/8.5	50.5/8.5	50.5/8.5		
Loop: Local [A]nalog	Local [D]igital	[L]ine	[R]emote	[B]ackplane	
Loop [0]ff	[C]lear Counters	Insert [E]rror			
BERT: [2]047	[5]11	[6]3 All [1]'s	All [0]'s	Of[f]	

The Diagnostics Manager fields are described in [Figure 10-2](#).

Table 10-2 Diagnostics Manager Fields

Port	Lists the four ports of the Quad OCU module.
Name	Lists the user-defined text string assigned as a name for the port.
Port Loop	Which type of loop is currently in place for each port. Displays "Off" if none.
Backplane Loop	Loops a data connection from the link back to the link via the backplane. Since this incorporates most of the card's hardware and software, this is a useful test to check card integrity. Note that a user connection must already be in place prior to invoking this loopback.
Bert	When On, indicates the selected pseudo-random bit error rate test pattern.
Secs. in Test	Once the BERT test is started, the length of the test is measured (seconds).
Local Errors	Displays the number of errors that occurred during the test.
Remote Errors	Displays the number of errors reported at the remote site during the test.
State	Shows the present status of the port, in Figure 10-6 this field displays "DDS Carrier Lost" because no circuit was connected.
Bipolar Error	Indicates recent status with Yes or No and a total count of Bipolar Violations (BPVs) received.
Loss of Frame	Indicates whether frame synchronization has been lost, and a count of frame loss occurrences. In the absence of signal, fame loss is not counted.
LineLoss db/km	Shows the calculated line loss ratioon the receive pair.

Commands

The following commands invoke additional screens and/or functions.

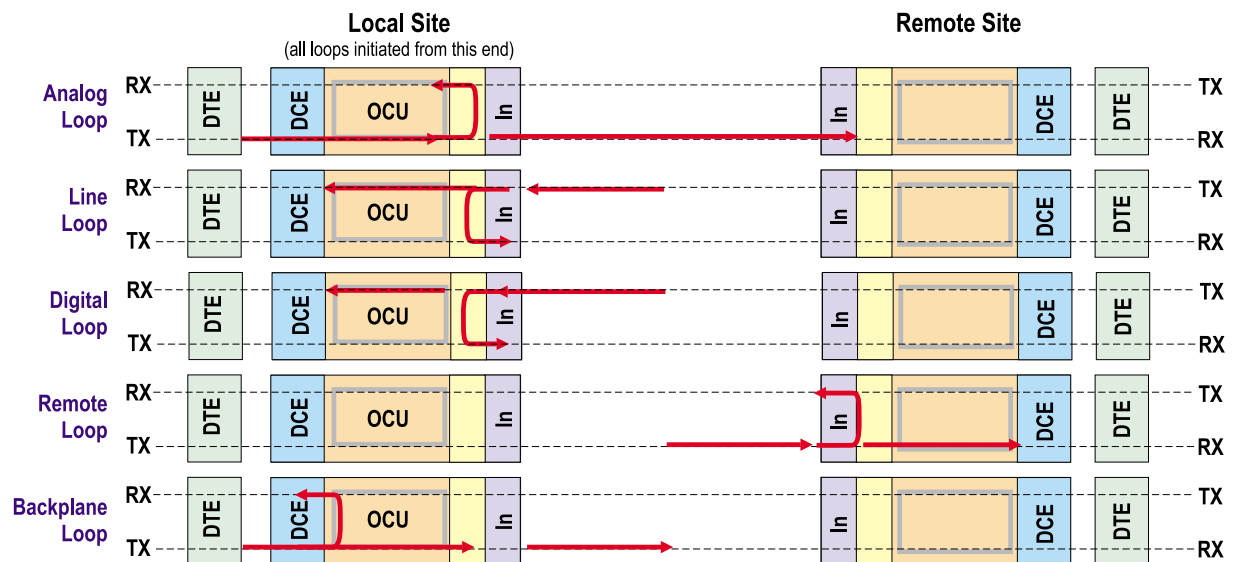
Table 10-3 Hot Keys

Loop:	Allows the selection of any of the loopback tests supported byv the Quad OCU. For a visual representation of the location and direction of these loopbacks, see Figure 10-7 .
BERT:	Allows the selection of various test patterns: 2047—

Loopback Types

Available loopback types are illustrated in [Figure 10-7](#).

Figure 10-7 Quad OCU Loops



Quad OCU Utilities

To access the Quad OCU Utilities, follow these steps:

1. From the **AS4000 Main Menu**, select **Node Summary**.
2. Select a slot which contains a Quad OCU.
3. From the Quad OCU **Main Menu**, select **Utilities**.

Figure 10-8 Utilities Menu

Verilink Corporation	AS4000 -Quad OCU	Slot: 9 Help = [?]
<p>OCU Utilities</p> <p>Board Status: In Service</p> <p>Monitor System Clocks</p> <p>Backplane Integrity</p> <p>Reset OCU Board</p> <p>System Manager Interface</p>		

System Manager Interface Statistics

To view System Manager Interface Statistics, such as map checksum or byte count, follow these steps:

1. From the **AS4000 Main Menu**, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the **Quad OCU Main Menu**, select Utilities.
4. From the **Utilities Menu**, select System Manager Interface Status.

Figure 10-9 System Manager Interface Status

Verilink Corporation	AS4000 -Quad OCU	Slot: 9 Help = [?]
System Manager Interface Status		

Configuration Map sequence number.....	18	
Downloaded Config Map sequence number...	18	
Configuration Map Checksum.....	0	
Configuration Map Byte Count.....	0	
Number of Configuration Map changes.....	2	
Number of Configuration Maps downloads..	1	
System Manager Level Identifier.....	600	
System Manager Id.....	61	
System Files sequence number.....	1	

The System Manager Interface Status is a view-only display that shows the communications between the SMC board and all of the loaded application modules. This screen is generally used for high level technical troubleshooting at the system programming level.

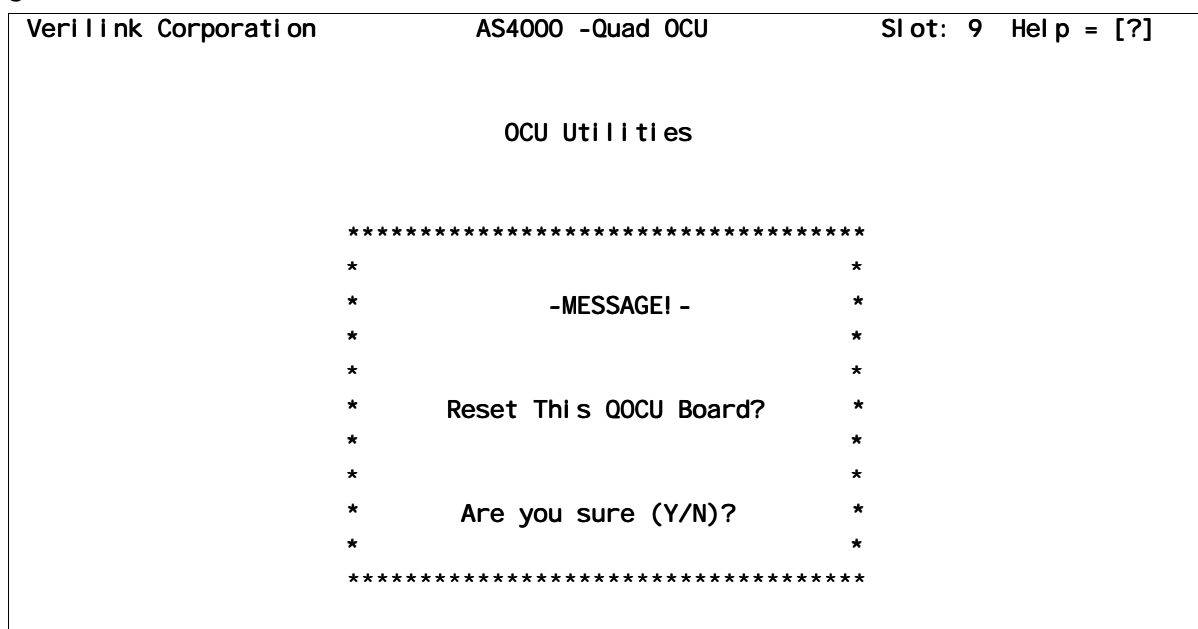
Reset Device

Reset Device causes the card to initialize in the same manner as power up. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

To Reset the device, follow these steps:

1. From the **AS4000 Main Menu**, select Node Summary.
2. Select a slot that has been configured for Quad OCU.
3. From the Quad OCU **Main Menu**, select Utilities.
4. From the **Utilities Menu**, select Reset Device.

Figure 10-10 Reset Device



5. Upon resetting the device, type "X". A new message appears: Reset Device? Are you sure (Y/N)?

About Menu

Procedure To display identification information for the Quad OCU module:

1. From the **Main Menu**, select Node Summary.
2. Select a Slot that has been configured for Quad OCU.
3. From the **Quad OCU Main Menu**, select About.

Figure 10-11 Sample About Menu

VeriLink Corporation	AS4000 -Quad OCU	Slot: 9 Help = [?]
<p>About Screen</p> <p>-----</p> <p>Version.....: 02.00F</p> <p>Release Date.....: April 13, 1999</p> <p>Checksum.....: 452C</p> <p>Front Card Xilinx Version: front04</p> <p>Rear Card Type.....: Quad OCU</p> <p>Rear Card Revision.....: 0</p> <p>Rear Card Xilinx Version.: rear3413</p> <p>Ram Access.....: 16 bits wide</p>		

The About fields are described in [Table 10-4](#).

Table 10-4 About Field Descriptions

Version	This is the software version currently in the Quad OCU's flash memory.
Release Date	The engineering release to production date.
Checksum	The sum of all bytes in the Quad OCU card's flash memory at power up.
Front Card XILINX Version	The hardware version of downloadable, programmable devices in the front module.
Front Card Rev	Displays the front card's revision level.
Rear Card Type	Displays the type of rear card in the slot.
Rear Card Rev	Displays the rear card's revision level.
Rear Card XILINX Version	The hardware version of downloadable, programmable devices in the rear module.

The AS4000 Quad DS-1 Module can operate in an HDSL or SDSL mode using an optional xDSL rear module fitted with the appropriate HDSL (full T1) or SDSL (fractional T1) daughter-board.

In this application the typical Quad DS-1 Rear Interface Module is replaced with the Quad HDSL Rear Interface Module. The logical T1 datastream, complete with framing and line coding, is then carried as the payload of the xDSL facility.

All of the menus and options which apply to the Quad DS-1 module also apply when it is used for xDSL. Only the additional features and options specific to DSL operation are covered in this chapter. For information about the standard Quad DS-1 menus refer to Chapter 5, "[Quad DS-1 Module](#)".

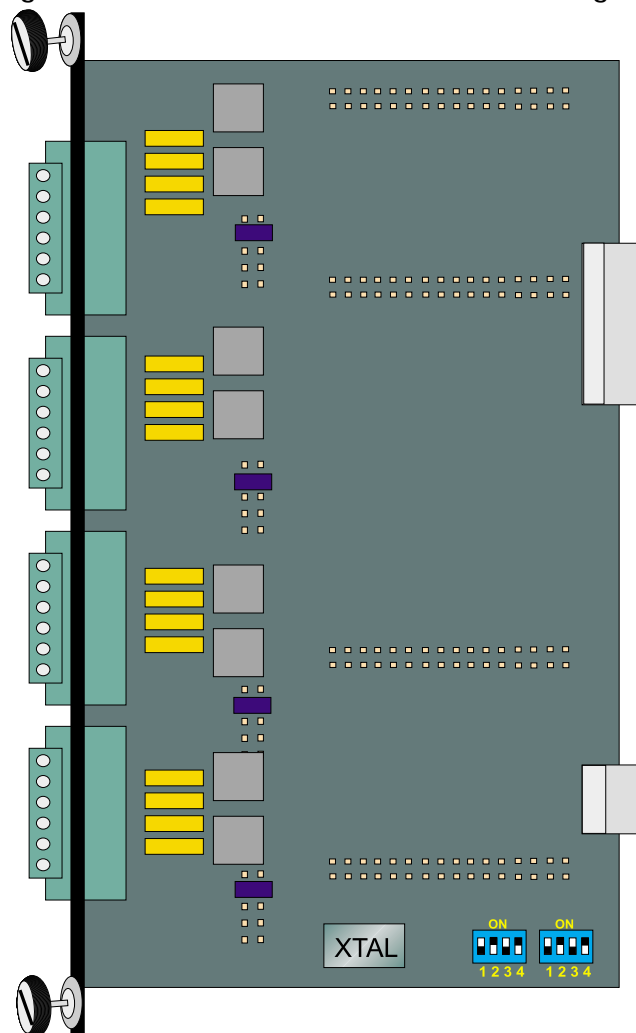
Installing xDSL Daughter Cards

Before you can use the DSL related functions of the Quad DS-1 module, you must install an xDSL Rear Interface Module which has one or more HDSL or SDSL daughter boards fitted.

If your daughter boards are not already mounted to an xDSL Interface Module, use the following procedure to mount them.

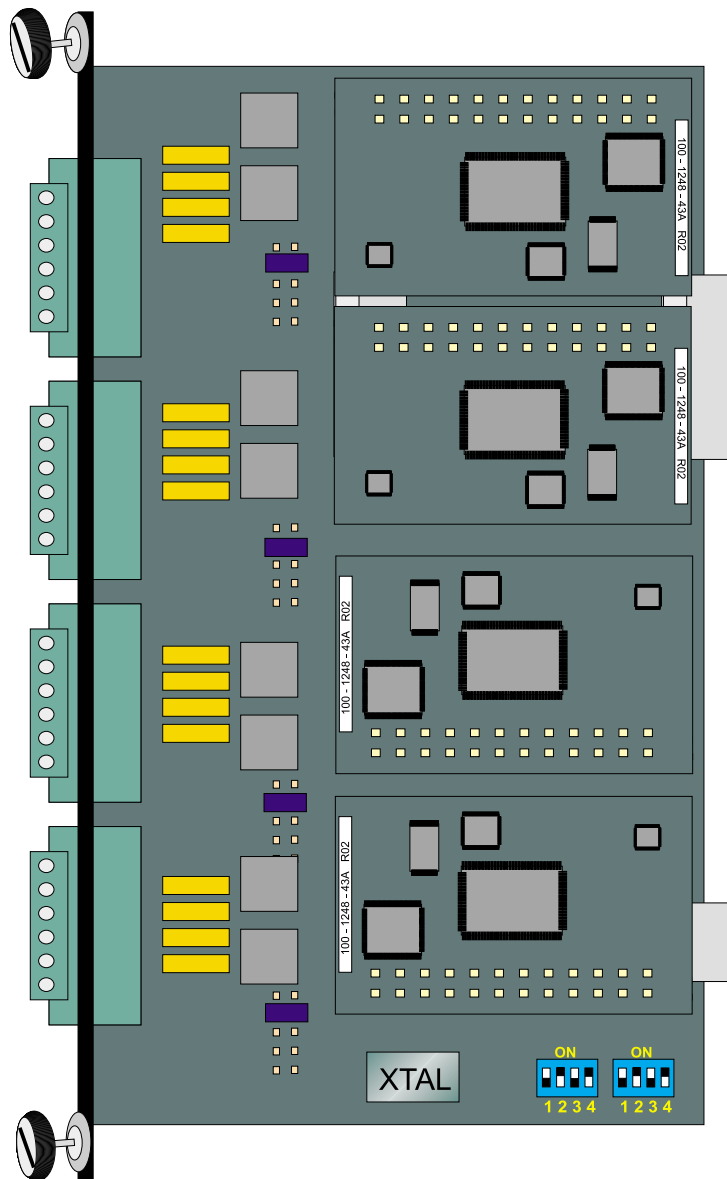
1. Prepare a static free workspace in a carpet-free area. Wear a ground strap to protect sensitive electronic components from static electricity. Connect the ground strap to a suitable earth ground, such as the AS4000 chassis.
2. Remove the xDSL Interface Module from the protective anti-static bag. Place it on the protective bag with the front panel on the left and the component side up. The text on the printed circuit board will be oriented normally for reading. See [Figure 11-1](#).
3. The HDSL (Full T1) or SDSL (Fractional T1) modules for port 1 and port 2 are mounted component side down with the connector along the top edge. Modules for ports 3 and 4 are mounted component side down with the connectors at the bottom. See [Figure 11-2](#).

Figure 11-1 xDSL Interface Module Without Daughter Cards



4. Set the two 4-position dipswitches as shown in [Figure 11-1](#). The Berg jumpers must also be left as shown, they are reserved for future use.

Figure 11-2 xDSL Interface Module with Daughter Boards Fitted



5. Continue to use the ground strap and anti-static precautions until you mount the completed xDSL Interface Module assembly in the desired AS4000 chassis.

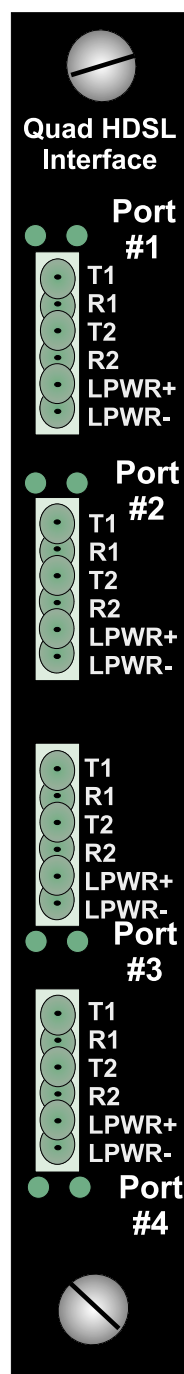
Connecting Local Loops

The Quad HDSL Interface Module is connected to the telco provided or customer owned wire pairs by means of screw down connections. For each port, a two part connector is provided with six positions. When the removable portion of the green plastic connector is pulled off, the legend masked on the rear panel becomes visible. See [Figure 11-3](#).

The first pair of wires is connected to T1 and R1. When used, the second pair is connected to T2 and R2, and in rare situations requiring a line-powered doubler, power to the in-circuit doubler can be derived from the pair LPWR+ and LPWR-.

NOTE: Terms like "receive pair" and "transmit pair" are not used in xDSL. Each pair carries both transmit and receive signals.

Figure 11-3 Quad HDSL Interface - Rear View



xDSL Configuration

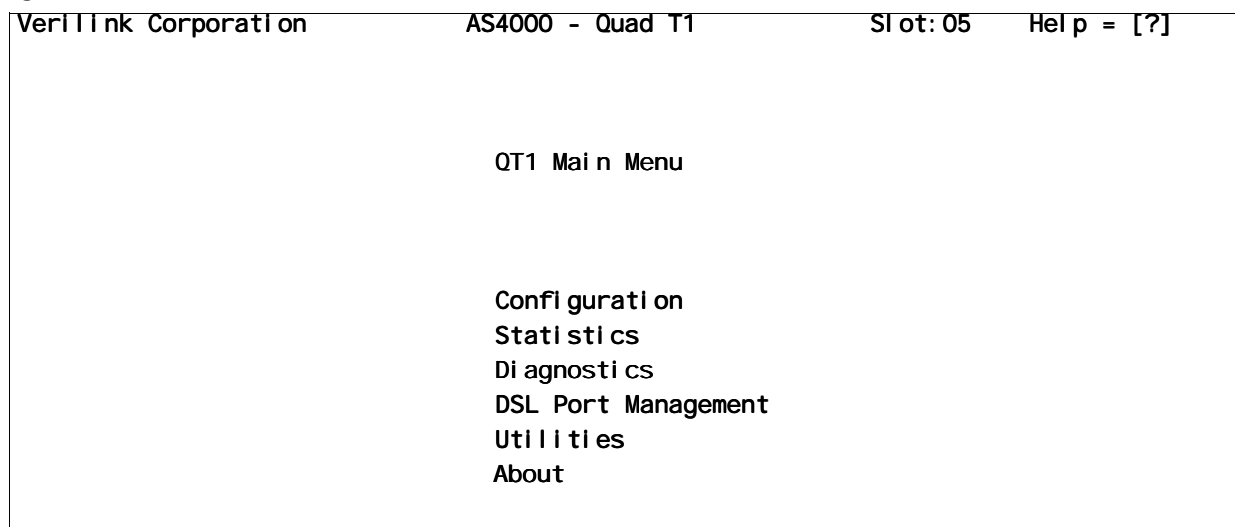
NOTE: In order to view the menus associated with the xDSL application, you must have the Quad DS-1 front card and the xDSL rear card in the equipment shelf. The slot must be configured for Quad DS-1.

If you have just connected to the AS4000 node, from the **Main Menu**:

- Select **Node Summary**
- Use your spacebar or cursor arrow keys to highlight the desired Quad DS-1 module
- Press ENTER to access the **Quad DS-1 Main Menu**.

NOTE: With the xDSL Rear Interface Module fitted, the Quad DS-1 **Main Menu** has an additional menu item, **DSL Port Management**, which is the access point for all DSL related configuration and diagnostic activity.

Figure 11-4 xDSL Main Menu



Select DSL Port Management To access the options specific to the xDSL modules select the **DSL Port Management Menu**.

Figure 11-5 xDSL Port Configuration Menu

Verilink Corporation	AS4000 - Quad T1	Slot: 04	Help = [?]
<p>DSL Port Management Menu</p> <p>Port 1</p> <p>Port 2</p> <p>Port 3</p> <p>Port 4</p> <p>Hit Ctrl Z to Exit xHDSL mini module</p> <p>Exit menu = [X]</p>			

Use the Port Configuration Menu to select a port which has an HDSL or SDSL daughter board fitted. All four ports will be listed on this menu. If a port without a daughter board is selected, a blank menu screen will appear. In either case, use "Control-Z" to return to the DSL Port Management Menu.

NOTE: The menus presented after a DSL port is selected come directly from the firmware on the xDSL daughter card. For this reason they do not conform to the same style or command conventions as the other AS4000 menus.

NOTE: After selecting a DSL port, a prompt appears saying **HIT SPACE BARS**. Most keyboards only have one space bar. What this prompt really means is that the user should press the space bar twice. This allows the xDSL daughterboard to adjust to the terminal speed, word size and parity.

NOTE: The menus presented after selecting a DSL port do not indicate how the user may exit. Remember to use "Control-Z" to exit from these menus. When not in a DSL port submenu the "Control-Z" keystroke has a different purpose, it is used to inhibit the terminal or Telnet session idle-timeout feature.

Figure 11-6 xDSL Port Configuration Menu

HI -GAIN m/OEM-FT1	MAINTENANCE TERMINAL MAIN MENU (ver V1.4 -0004)
	CIRCUIT ID#: 55RESS7549981
	A. VIEW SPAN STATUS
	B. SET CLOCK
	C. SYSTEM SETTINGS
	D. LOOPBACK MODE: NONE
	E. VIEW PERFORMANCE DATA
	F. VIEW PERFORMANCE HISTORY
	G. VIEW ALARM HISTORY
	H. ENTER CIRCUIT ID #

Table 11-1 xDSL Port Configuration Menu.

VIEW SPAN STATUS	Use to create a display of the current condition of the circuit connected to the selected port. See Figure 11-7 .
SET CLOCK	Use to set the date and time. See Figure 11-8 .
SYSTEM SETTINGS	This is the main configuration menu for the xDSL daughter board. See Figure 11-9 .
LOOPBACK MODE:	Use Loopback Mode to establish and terminate loopbacks. See Figure 11-10 .
VIEW PERFORMANCE DATA	Shows 24-hours of errored second and unavailable second information. See Figure 11-11 .
VIEW PERFORMANCE HISTORY	Shows a 7-day history of errored second and unavailable second information. See Figure 11-12 .
ENTER CIRCUIT ID #	Use to enter information which can be used to identify the circuit. In the example menus shown the circuit ID used is "55RESS7549981".

Viewing Span Status

To view the span status, type "A". A screen of statistical information is displayed.

Figure 11-7 Span Status

SPAN STATUS			
(HLU/ver1.4-0004: HRU/ver0.0-0000)			
TIME: 23:44:46			
DATE: 03/22/99	CIRCUIT ID#: 55RESS7549981		
ALARMS: LAIS LOSW			
LOOPBACK: OFF			
	HLU	HRU	
	HDSL	HDSL	
	cur/min/max	cur/min/max	
MARGIN:	N/A	N/A	dB
PULSE ATTN:	N/A	N/A	dB
PPM OFFSET:	N/A	N/A	ppm
24 HOUR ES:	00000	00000	seconds
24 HOUR UAS:	87289	00000	seconds
DS1 STATUS			
	HLU	HRU	
24 HOUR BPV Seconds:	00000	00000	
24 HOUR UAS Count:	00000	00000	
Frame type:	ESF	N/A	
Code type:	AMI	N/A	
(E)xit (C)lear (U)pdate			

Elements of the **Span Status** display are defined in [Table 11-2](#).

Table 11-2 Span Status Display

Parameter	Description
ALARMS:	The current alarms, if any.
LOOPBACK:	The type of loopback currently on the port, if any.
MARGIN:	The ratio of signal to noise. Displays a value only when there is a signal present.
PULSE ATTN:	Amount, expressed in decibels, of signal loss in the received signal.
PPM OFFSET:	Deviation in frequency of the received signal, expressed in parts per million.
24 HOUR ES:	Total number of errored seconds in the previous 24 hours.
24 HOUR UAS:	Total number of unavailable seconds in the previous 24 hours.
24 HOUR BPV Seconds:	Total number of seconds with one or more bipolar violations in the previous 24 hours.
24 HOUR UAS Count:	Total count of instances of unavailable seconds in the previous 24 hours.
Frame type:	The type of T1 framing in use on the port. May be ESF or SF (D4).
Code type:	The type of line coding in use on the port. May be AMI or B8ZS.

Set Clock

Use **Set Clock** to define the current time and date. This assures that alarm messages will have the correct date and time attached to them.

Figure 11-8 Set Clock

SET CLOCK	
TIME:	13: 39: 43
DATE:	08/11/99
CIRCUIT ID#:	55RESS7549981
Format: HH: MM	
	MM/DD/YY
NEW TIME:	
NEW DATE:	

System Settings Type "C" to access the **System Settings Menu**.

Figure 11-9 System Settings

SYSTEM SETTINGS	
TIME: 13: 44: 20	
DATE: 08/11/99	CIRCUIT ID#: 55RESS7549981
SMART-JACK (L)B:	ENABLE
(S)PECIAL LPBK:	GNLB
(Z)BTSI:	OFF
ES ALARM TH(R)ES:	NONE
LOOPBACK (T)IMEOUT:	60
(A)LARM:	ENABLE
(D)S1 LINE CODE:	AUTO
(F)RAMING:	AUTO
AIS ON (H)DSL ALRM:	ENABLE
AIS ON S(M)JK/NREM:	ENABLE
MAR(G)IN ALM THRES:	4
DSO (B)LOCKING: xx - Blocked Channels	
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	
	xx xx xx xx xx xx xx xx xx xx xx xx xx
(E)xit	
Enter the letter in parenthesis (X) to change any setting	

Table 11-3 documents the **System Settings Menu**.

Table 11-3 System Settings Menu

SMART-JACK (L)B:	Enables or disables response to the special loopback codes used to loop-up a smart jack (network termination device) on a standard US T1 circuit.
(S)PECIAL LPBK:	Toggles through a list of special loopback codes the xDSL module can be configured to support, included loopback types are: <ul style="list-style-type: none"> • GNLB—Generic Loopback Code designed for use with PairGain modules. • A1LB—Loopback code proposed for HDSL service in the T1E1.4/92 recommendation. • A2LB—Teltrend loopback code used by Southwestern Bell. • A3LB—Wescom loopback code used by New England Telephone. • A4LB—Wescom Model 1 code used by New York Telephone. • A5LB—Teltren Model 1 code used by Southern New England Telephone (SNET).
(Z)BTSI:	Enables or disables the use of Zero Bit Timeslot Insertion, a rarely used T1 framing method that allows the use of 64K per DSO on a facility using AMI line coding.
ES ALARM TH(R)ES:	A one-second period in which one but less than 320 CRC-6 errors has occurred is known as an second. This command sets the threshold for declaring an errored second alarm.

LOOPBACK (T)IMEOUT:	Sets an optional timer which can be used to turn off a loopback. This might be useful if a test operator forgets or, due to circuit noise, is unable to put down a loopback.
(A)LARM:	A timer that tracks the number of seconds in the current 15-minute interval.
(D)S1 LINE CODE:	The type of DS-1 line coding which is being mapped across this DSL link.
(F)RAMING:	The type of DS-1 framing which is being mapped across this DSL link.
AI S ON (H)DSL ALRM:	Enables or disables transmission of unframed all-ones to the local equipment as an Alarm Indication Signal during an HDSL alarm state.
AI S ON S(M)JK/NREM:	Enables or disables transmission of unframed all-ones to the local equipment as an Alarm Indication Signal during a smart jack loopback or a network remote loopback.
MAR(G)IN ALM THRES:	Sets the threshold for the margin (signal-to-noise ratio) alarm.
DSO (B)LOCKING: xx - Blocked Channel s	Sets which of the T1 DSOs will not be carried on this DSL link. In the example shown the "x" characters under timeslots 13 through 24 indicate that these timeslots are not being carried end-to-end.

Loopback Mode

Use the Loopback Mode Menu to put up and take down loopbacks. The network type loopbacks (beginning with "N") face the DSL network lines. The customer loopbacks (with names beginning with "C") face the AS4000 midplane. HLU designates a local HDSL unit loopback, while HRU designates remote loopback types.

Figure 11-10 Loopback Mode

LOOPBACK MENU	
TIME: 20: 15: 20	
DATE: 08/16/99	
CIRCUIT ID#: 55RESS7549981	
A. DISABLE LOOPBACKS	
B. NETWORK LOOP HLU	(NLOC)
C. NETWORK LOOP HRU	(NREM)
G. CUSTOMER LOOP HLU	(CREM)
H. CUSTOMER LOOP HRU	(CLOC)
(E)xit	

Performance Data

Use the **Performance Data Menu** to view 24 hours of performance statistics. The display shows both errored seconds and unavailable seconds for the DS1 and HDSL logical functions.

Figure 11-11 Performance Data

Date: 08/16/99	PERFORMANCE DATA			
CIRCUIT ID#: 55RESS7549981				
ERRORED SECONDS/UNAVAILABLE SECONDS				
	DS1		HDSL	
	HLU	HRU	HLU	HRU
17: 00	000/000	000/000	000/900	000/000
17: 15	000/000	000/000	000/900	000/000
17: 30	000/000	000/000	000/900	000/000
17: 45	000/000	000/000	000/900	000/000
18: 00	000/000	000/000	000/900	000/000
18: 15	000/000	000/000	000/900	000/000
18: 30	000/000	000/000	000/900	000/000
18: 45	000/000	000/000	000/900	000/000
19: 00	000/000	000/000	000/900	000/000
19: 15	000/000	000/000	000/900	000/000
19: 30	000/000	000/000	000/900	000/000
19: 45	000/000	000/000	000/900	000/000
20: 00	000/000	000/000	000/900	000/000
20: 15	000/000	000/000	000/900	000/000
20: 30	000/000	000/000	000/900	000/000
20: 45	000/000	000/000	000/900	000/000
(E)xit (P)revious (N)ext				

Additional screens are shown when **(N)ext** is selected until all 96 of the 15-minute intervals in a 24-hour period are displayed.

Performance History

Performance History displays a summary of errored and unavailable seconds for the preceeding week.

Figure 11-12 Performance History

Time: 21: 15: 08		7 DAY HISTORY		
CIRCUIT ID#: 55RESS7549981				
ERRORED SECONDS/UNAVAILABLE SECONDS				
	DS1		HDSL	
	HLU	HRU	HLU	HRU
08/09	00000/00000	00000/00000	00000/00000	00000/00000
08/10	00000/00000	00000/00000	00000/00000	00000/00000
08/11	00000/00000	00000/00000	00000/00000	00000/00000
08/12	00000/00000	00000/00000	00000/86398	00000/00000
08/13	00000/00000	00000/00000	00000/86400	00000/00000
08/14	00000/00000	00000/00000	00000/86400	00000/00000
08/15	00000/00000	00000/00000	00000/86400	00000/00000
current	00000/00000	00000/00000	00000/77400	00000/00000
(E)xit				

The AS4000 Octal Voice Module supports up to 8 voice channel connections. Each voice channel is digitized using industry standard PCM technology into a single DS0. Three available rear interface modules allow support of E&M signalling, FXS or FXO methods for connecting to the local telephone equipment or line.

This chapter covers the Octal Voice Module, the E&M Interface rear module, the FXS-PLAR Interface rear module and the FXO-DPT Interface rear module.

Installing Interface Modules

For best results, install the selected Interface Module (E&M, FXS, or FXO) before installing the Octal Voice front module. This allows the front module to detect the type of interface module fitted and present appropriate menus. The interface module types are:

- **Octal 4 Wire E&M** - provides eight 4 wire interfaces via two 50-pin Telco type connectors. Leads supported include Tip, Ring, Tip1, Ring1, E, M, SB, and SG. Applications include 2/4 Wire T0 analog data applications, and 2/4 Wire E&M voice trunks.

NOTE: *The E&M method of connecting voice trunks uses two wires for transmit, two wires for receive, two wires for E&M, one wire for signal ground and one wire for battery ground. The expression "4 wire" in this context means that the voice signal itself is carried on four wires.*

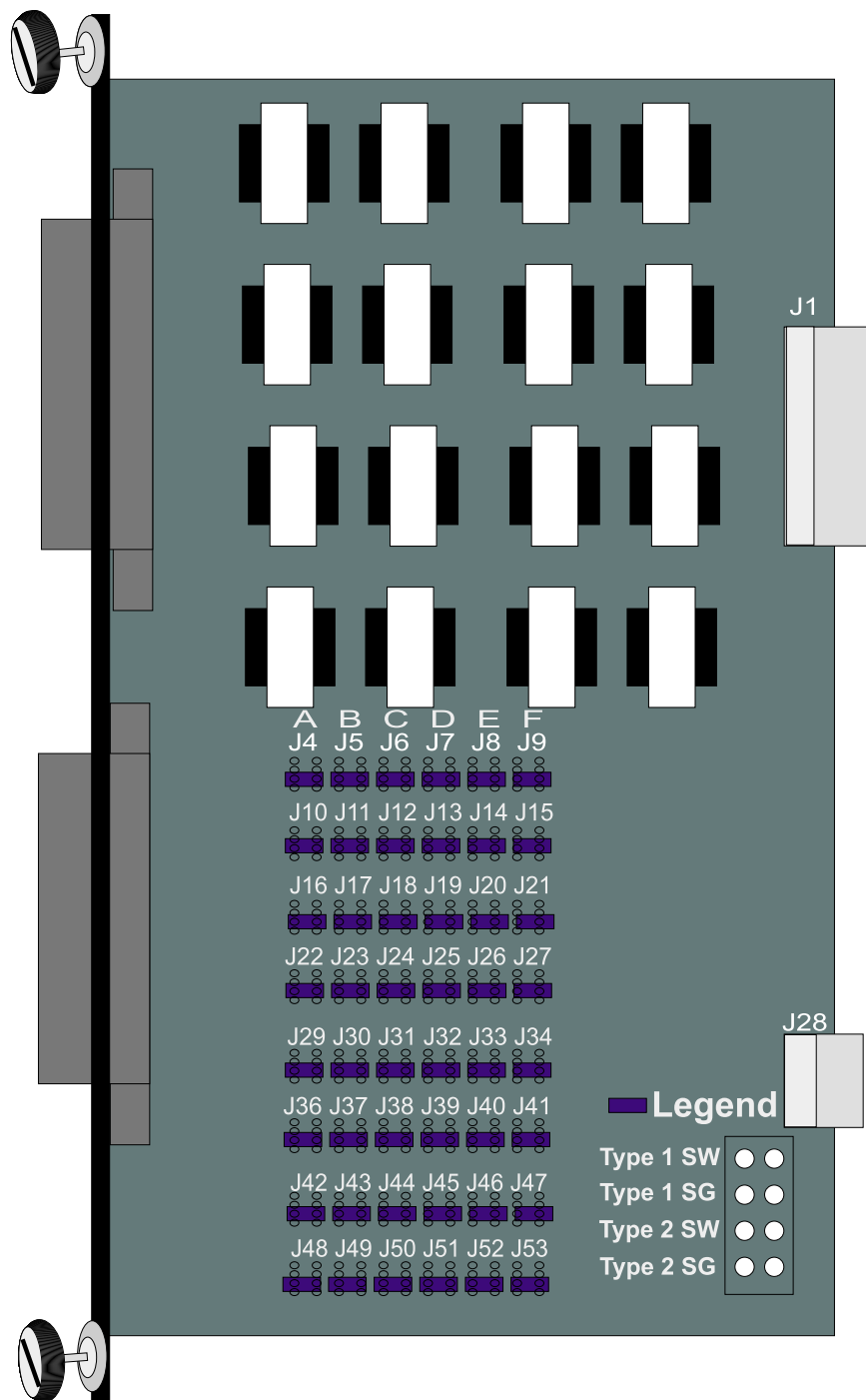
- **Octal 2 Wire FXO/DPT** - provides eight Foreign Exchange Office (FXO) or Dial Pulse Termination (DPT) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXO/DPT can sink and detect ringing or sink and detect forward or reverse battery current dependent on configuration. The 2W/FXO/DPT can be employed to extend dial tone to a remote PBX or for support of Direct Inward Dialing (DID).
- **Octal 2 Wire FXS** - provides eight Foreign Exchange Station (FXS) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXS supports distinctive ringing, and can utilize loop start or ground start connections to conventional analog telephone devices. Ring generation is integral to the 2W/FXS.

Use the **Node Summary Menu** to verify, and if necessary change the front and rear module types for your voice application.

E&M Interface Module Options

The E&M Interface Module has options which are set using strips of ganged Berg jumpers. See [Figure 12-1](#).

Figure 12-1 E&M Interface Module



Setting Berg Jumpers

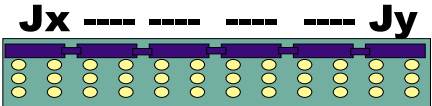
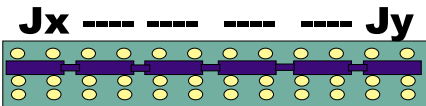
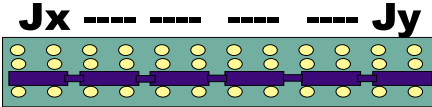
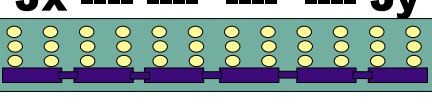
For each of the eight voice channel inputs, one strip of ganged Berg jumpers is used to set the type of E&M signalling being used.

- J4 through J9 set the E&M type for voice channel 1.
- J10 through J15 set the E&M type for voice channel 2.
- J16 through J21 set the E&M type for voice channel 3.
- J22 through J27 set the E&M type for voice channel 4.
- J29 through J34 set the E&M type for voice channel 5.
- J36 through J41 set the E&M type for voice channel 6.
- J42 through J47 set the E&M type for voice channel 7.
- J48 through J53 set the E&M type for voice channel 8.

Selecting E&M Signalling Type

Use the information in table to position the Berg jumper strip correctly for each voice channel.

Table 12-1 Berg Jumper Strip Positions

E&M Signalling Type	Illustration
Type 1 Signalling Berg jumper strip across top row in field	
Type 1 Switching Berg jumper strip across second row in field	
Type 2 Signalling Berg jumper strip across third row in field	
Type 2 Switching Berg jumper strip across bottom row in field	

Octal Voice with E&M Rear Module Menus

This section describes the menus used for configuration, testing and troubleshooting the Octal Voice Module when the 4-wire E&M rear module is fitted.

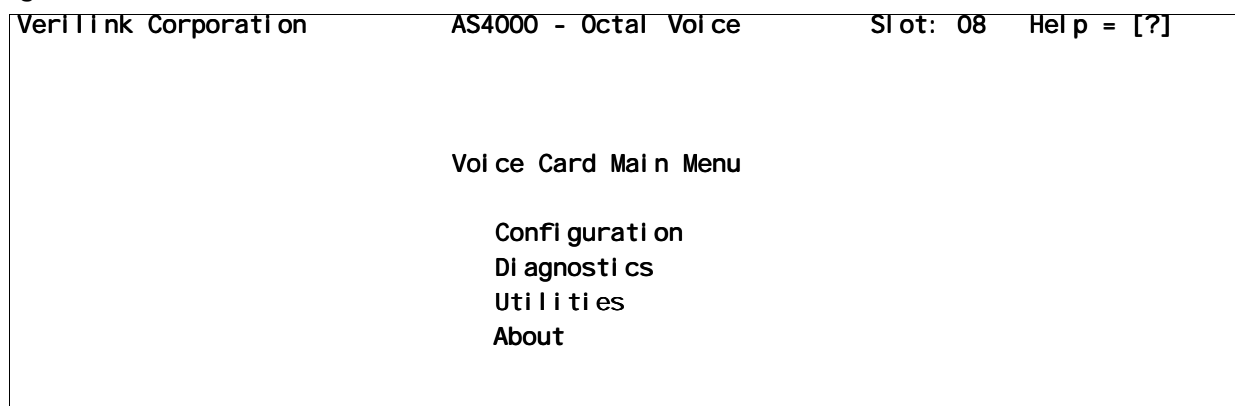
Configuration

If you have just connected to the AS4000 node, from the **Main Menu**:

- Select **Node Summary**
- Use your spacebar or cursor arrow keys to highlight the desired Octal Voice module
- Press ENTER to access the **Octal Voice Main Menu**.

NOTE: In order to view the menus associated with the Octal Voice application, you must have the Octal Voice front card and one of the three available interface (rear) cards in the equipment shelf. The slot must be configured for Octal Voice.

Figure 12-2 Octal Voice Main Menu



Configuration

Typically the first task will be to configure the voice module. To access the **Configuration Menu** highlight **Configuration** and press ENTER.

The **Configuration Menu** is displayed. See [Figure 12-3](#).

Figure 12-3 Voice Module Configuration Menu

VeriLink Corporation		AS4000 - Octal Voice			Slot: 08		Help = [?]	
Octal Voice Card Configuration								
Port#	Name	Port Status	Type	Mode	Codec Mode	Rx Gain	Tx Gain	
01	1st Voice	In Service	E&M II	Switching	mu-Law	-4 dB	+2 dB	
02	2nd Voice	In Service	E&M II	Switching	mu-Law	+2 dB	+6 dB	
03	Port03	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
04	Port04	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
05	Port05	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
06	Port06	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
07	Port07	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
08	Port08	Out of Service	E&M II	Switching	mu-Law	0 dB	0 dB	
Configured Rear Card Type: Octal Voice E&M					Operation Mode...: PCM 64Kbps			
Actual Rear Card Type....: Octal Voice E&M					Backplane Status: On the Bus			

Use the **Octal Voice Card Configuration Menu** to select a port. With the cursor over a port number, press **ENTER** to access a submenu used to change the values displayed on this screen.

Figure 12-4 displays the **Configuration Submenu**.

Figure 12-4 Configuration Submenu

```
VeriLink Corporation          AS4000 - Octal Voice          Slot: 08    Help = [?]

                               Octal Voice Card Configuration
                               -----

Port# Selected....: 1
Name.....: 1st Voice
Port Status.....: In Service
Codec Mode.....: mu-Law
Rx Gain.....: -4 dB
Tx Gain.....: +2 dB

Use Default Settings = [D]
```

[Table 12-2](#) details the options on the **Configuration Submenu**.

Table 12-2 Octal Voice Configuration Submenu

Command	Usage
Name	Used to set a text string for identifying this port.
Port Status	The In Service or Out Of Service status of the port. Press ENTER to toggle.
Codec Mode	The selection for "mu Law" (North America/Japan/Phillipines) or "A-Law" (Europe/elsewhere), determines the algorithm used for sampling voice data.
Rx Gain	The amount of gain (+) or loss (-) to be applied to the signal received from another location.
Tx Gain	The amount of gain (+) or loss (-) to be applied to the signal being sent from this location.
Use Default Settings	Sets the port to the factory default values for all options.

Octal Voice with FXS/PLAR Rear Module Menus

This section describes the menus used for configuration, testing and troubleshooting the Octal Voice Module when the FXS/PLAR rear module is fitted.

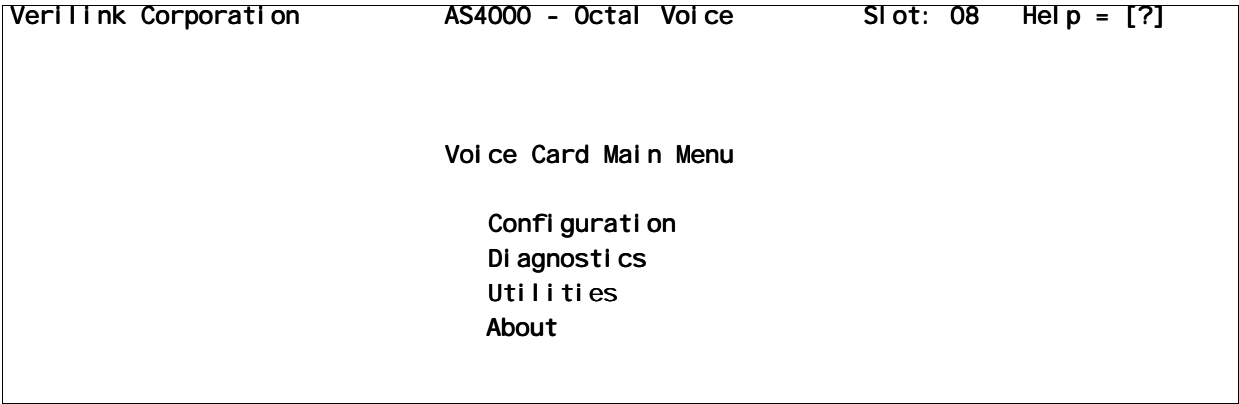
Configuration

If you have just connected to the AS4000 node, from the **Main Menu**:

- Select **Node Summary**
- Use your spacebar or cursor arrow keys to highlight the desired Octal Voice module
- Press ENTER to access the **Octal Voice Main Menu**.

***NOTE:** In order to view the menus associated with the Octal Voice application, you must have the Octal Voice front card and one of the three available interface (rear) cards in the equipment shelf. The slot must be configured for Octal Voice.*

Figure 12-5 Octal Voice Main Menu



Configuration

Typically the first task will be to configure the voice module. To access the **Configuration Menu** highlight **Configuration** and press ENTER.

The **Configuration Menu** is displayed. See [Figure 12-6](#).

Figure 12-6 Voice Module Configuration Menu

VeriLink Corporation		AS4000 - Octal Voice		Slot: 08		Help = [?]	
Octal Voice Card Configuration							
Port#	Name	Port Status	Port Type	Codec Mode	Rx Gain	Tx Gain	
01	First Voice	In Service	PLAR	mu-Law	-4 dB	+2 dB	
02	Second Voice	In Service	Loop Start	mu-Law	+2 dB	+6 dB	
03	Third Voice	In Service	Ground Start	mu-Law	+2 dB	+4 dB	
04	Fourth Voice	In Service	Ground Start	A-Law	+6 dB	+8 dB	
05	Fifth Voice	In Service	PLAR	mu-Law	-4 dB	-2 dB	
06	Sixth Voice	In Service	Loop Start	mu-Law	0 dB	0 dB	
07	Seventh Voice	In Service	Loop Start	mu-Law	0 dB	0 dB	
08	Port08	In Service	Loop Start	mu-Law	0 dB	0 dB	
Configured Rear Card Type: Octal Voice FXS/PLAR							Operation Mode.: PCM 64Kbps
Actual Rear Card Type....: Octal Voice FXS/PLAR							Backplane Status: On the Bus

Use the **Octal Voice Card Configuration Menu** to select a port. With the cursor over a port number, press ENTER to access a submenu used to change the values displayed on this screen.

[Figure 12-4](#) displays the **Configuration Submenu**.

Figure 12-7 Configuration Submenu

VeriLink Corporation		AS4000 - Octal Voice		Slot: 08		Help = [?]	
Octal Voice Card Configuration							

Port# Selected....: 1							
Name.....: First Voice							
Port Status.....: In Service							
Port Type.....: PLAR							
Codec Mode.....: mu-Law							
Rx Gain.....: -4 dB							
Tx Gain.....: +2 dB							

[Table 12-2](#) details the options on the **Configuration Submenu**.

Table 12-3 Octal Voice Configuration Submenu

Command	Usage
Name	Used to set a text string for identifying this port.
Port Status	The In Service or Out Of Service status of the port. Press ENTER to toggle.
Port Type	Determines whether the port will operate in Loop Start, Ground Start or PLAR mode.
Codec Mode	The selection for "mu Law" (North America/Japan/Phillipines) or "A-Law" (Europe/elsewhere), determines the algorithm used for sampling voice data.
Rx Gain	The amount of gain (+) or loss (-) to be applied to the signal received from another location.
Tx Gain	The amount of gain (+) or loss (-) to be applied to the signal being sent from this location.
Use Default Settings	Sets the port to the factory default values for all options.

Octal Voice with FXO/DPT Rear Module Menus

This section describes the menus used for configuration, testing and troubleshooting the Octal Voice Module when the FXO/DPT rear module is fitted.

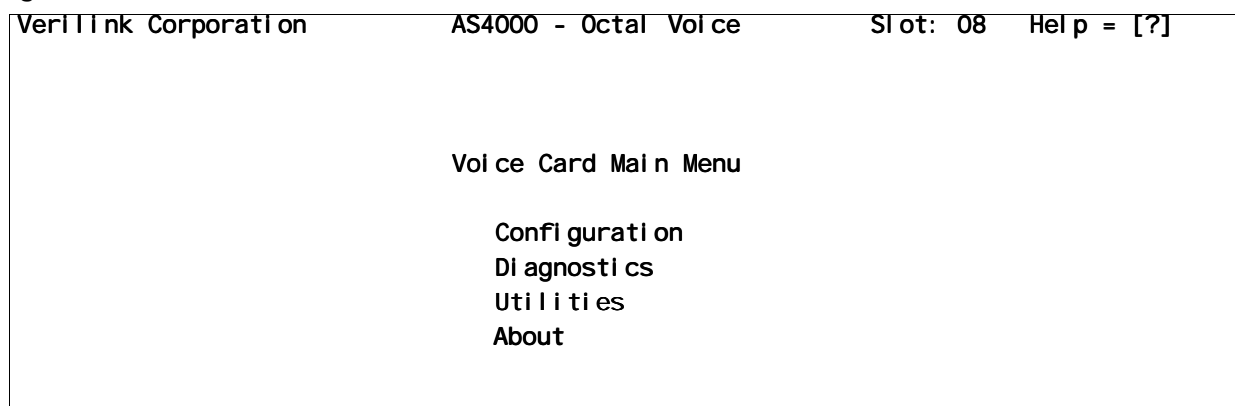
Configuration

If you have just connected to the AS4000 node, from the **Main Menu**:

- Select **Node Summary**
- Use your spacebar or cursor arrow keys to highlight the desired Octal Voice module
- Press ENTER to access the **Octal Voice Main Menu**.

NOTE: In order to view the menus associated with the Octal Voice application, you must have the Octal Voice front card and one of the three available interface (rear) cards in the equipment shelf. The slot must be configured for Octal Voice.

Figure 12-8 Octal Voice Main Menu



Configuration

Typically the first task will be to configure the voice module. To access the **Configuration Menu** highlight **Configuration** and press ENTER.

The **Configuration Menu** is displayed. See [Figure 12-6](#).

Figure 12-9 Voice Module Configuration Menu

Verilink Corporation		AS4000 - Octal Voice		Slot: 08	Help = [?]	
Octal Voice Card Configuration						
Port#	Name	Port Status	Port Type	Codec Mode	Rx Gain	Tx Gain

01	First Voice In Service		Loop Start	mu-Law	-4 dB	+2 dB
02	Second Voice In Service		Loop Start	mu-Law	+2 dB	+6 dB
03	Third Voice In Service		Ground Start	mu-Law	+2 dB	+4 dB
04	Fourth Voice In Service		Ground Start	A-Law	+6 dB	+8 dB
05	Fifth Voice In Service		Loop Start	mu-Law	-4 dB	-2 dB
06	Sixth Voice In Service		Loop Start	mu-Law	0 dB	0 dB
07	Seventh Voice In Service		Loop Start	mu-Law	0 dB	0 dB
08	Port08 In Service		Loop Start	mu-Law	0 dB	0 dB
Configured Rear Card Type: Octal Voice FX0/DPT				Operation Mode.: PCM 64Kbps		
Actual Rear Card Type....: Octal Voice FX0/DPT				Backplane Status: On the Bus		

Use the **Octal Voice Card Configuration Menu** to select a port. With the cursor over a port number, press ENTER to access a submenu used to change the values displayed on this screen.

[Figure 12-4](#) displays the **Configuration Submenu**.

Figure 12-10 Configuration Submenu

Verilink Corporation		AS4000 - Octal Voice		Slot: 08		Help = [?]	
Octal Voice Card Configuration							

Port# Selected....: 1							
Name.....: First Voice							
Port Status.....: In Service							
Port Type.....: Loop Start							
Codec Mode.....: mu-Law							
Rx Gain.....: -4 dB							
Tx Gain.....: +2 dB							
</							

[Table 12-2](#) details the options on the **Configuration Submenu**.

Table 12-4 Octal Voice Configuration Submenu

Command	Usage
Name	Used to set a text string for identifying this port.
Port Status	The In Service or Out Of Service status of the port. Press ENTER to toggle.
Port Type	Determines whether the port will operate in Loop Start, or Ground Start.
Codec Mode	The selection for "mu Law" (North America/Japan/Phillipines) or "A-Law" (Europe/elsewhere), determines the algorithm used for sampling voice data.
Rx Gain	The amount of gain (+) or loss (-) to be applied to the signal received from another location.
Tx Gain	The amount of gain (+) or loss (-) to be applied to the signal being sent from this location.
Use Default Settings	Sets the port to the factory default values for all options.

Diagnostics

The **Diagnostics Menu**, [Figure 12-11](#), presents a summary of test and in-service/out-of-service status for each voice channel port.

Figure 12-11 Voice Module Diagnostics Menu

VeriLink Corporation		AS4000 - Octal Voice		Slot: 08	Help = [?]
Octal Voice Card Diagnostics					
Port#	Name	Test Type	Port Status	Run Time	

01	1st Voice	Digital Loopback	In Service	55364	
02	2nd Voice	Analog Loopback	In Service	55355	
03	Port03	Backplane Loopback	In Service	55255	
04	Port04	Backplane Loopback with Tx Idle	In Service	55245	
05	Port05	Transmit Idle Pattern	In Service	55233	
06	Port06	Receive Idle Pattern	In Service	55216	
07	Port07	Tone Generator	In Service	55176	
08	Port08	Normal Operation	In Service	762	
Current Backplane Status.....: On the Bus					
Clear Run Time = [R]					
Clear All Counters = [A]					

To start or stop a diagnostic activity, place the cursor over the desired port and press ENTER. A submenu is displayed, with information specific to the selected port. See [Figure 12-12](#).

Figure 12-12 Octal Voice Diagnostics Submenu

VeriLink Corporation	AS4000 - Octal Voice	Slot: 08	Help = [?]
Octal Voice Card Diagnostics			

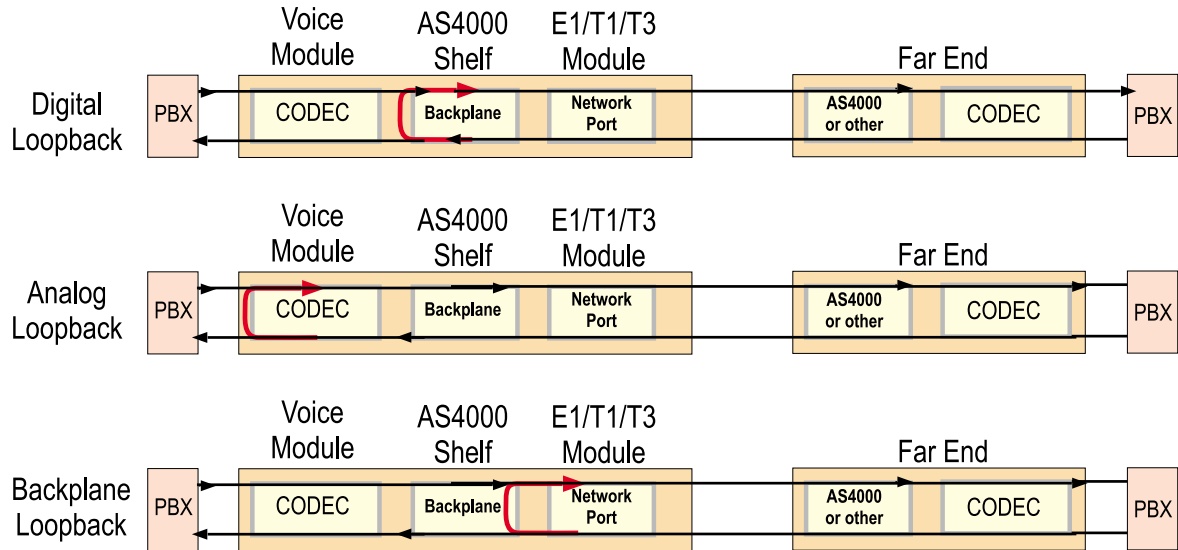
Port# Selected....: 8			
Name.....: Port08			
Select Test Type..: Normal Operation			
Tone Generator Setup = [S]			

Table 12-5 Voice Module Diagnostics Test Types.

Digital Loopback	Loops the signal while it is in a binary digital state. This test may affect adjacent voice module timeslots. It faces the backplane of the shelf, so a far-end site should see this loopback. Digital loopback may be performed on only one channel at a time.
Analog Loopback	Loops the signal while it is in an analog state. Analog loopbacks face the backplane and are visible at the far-end site. The signal passes through the digital to analog conversion process and then is converted back to a digital format again. This loopback tests the CODEC. Any number of analog loopbacks may be active at one time.
Backplane Loopback	Loops the signal toward the backplane and therefore towards the remote site. This loopback occurs at the interface of the Octal Voice Module and the shelf backplane.
Backplane Loopback with Tx Idle	Loops the signal toward the backplane at the interface of the Octal Voice Module and the shelf backplane. Also forces the A and B signalling bits to zero.
Transmit Idle Pattern	Sends A bit and B bit as zeroes to indicate a timeslot is idle.
Receive Idle Pattern	Overwrites actual received A and B bit values with zeroes.
Tone Generator	Inserts the selected DTMF tone into the timeslot.
Normal Operation	Ends all tests and returns the selected timeslot to an idle state.

Figure 12-13 illustrates the three major types of voice module loopbacks and indicates the location and direction of each.

Figure 12-13Voice Module Loopbacks



Utilities

The **Utilities Menu** offers access to system level functions.

Figure 12-14 Octal Voice Utilities Submenu

VeriLink Corporation	AS4000 - Octal Voice	Slot: 08	Help = [?]
Octal Voice Card Utilities			

Display Voice Signaling Status Display Codec Registers Content Display Backplane Time Slots Link Time Slot Profile Display Monitor Backplane Status Backplane Integrity System Manager Interface Resource Manager Dump Memory Content Reset Board			

[Table 12-6](#) lists the functions of the **Utilities Menu**.

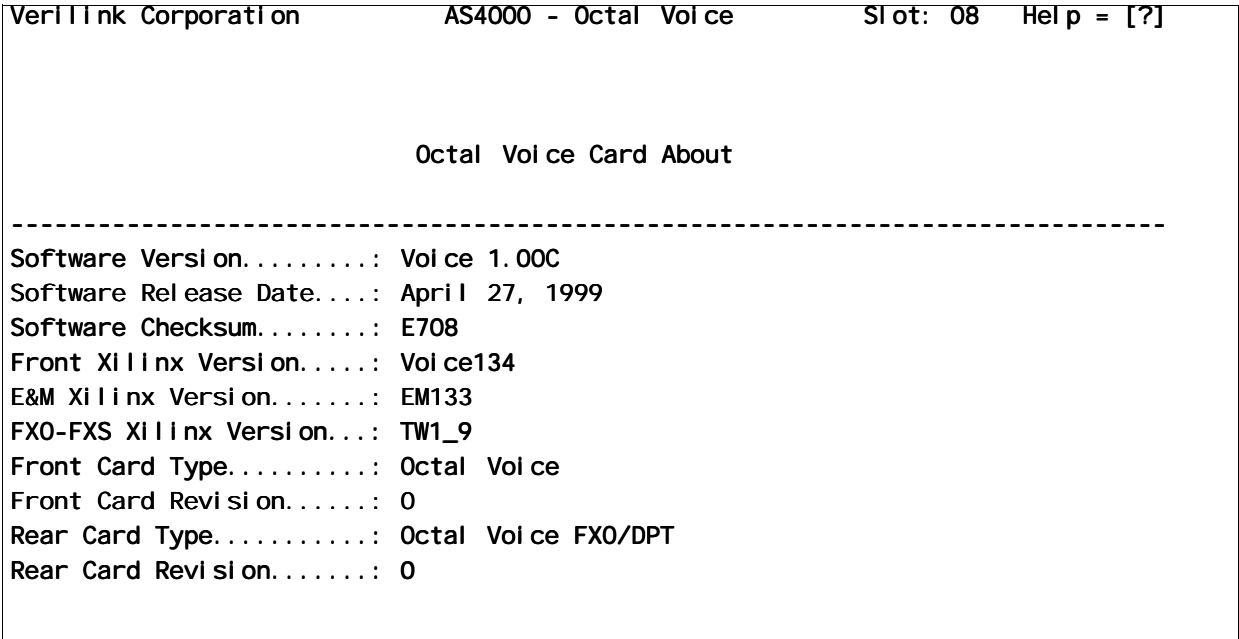
Table 12-6 Octal Voice Card Utilities

Display Voice Signaling Status	Shows the status of each voice channel as indicated by the A and B signalling bits.
Display Codec Registers Content	Shows the status of the registers in the Analog to Digital conversion process.
Display Backplane Time Slots	Shows the timeslots mapped to shelf backplane resources.
Link Time Slot Profile Display	Shows information on mappings to the channels.
Monitor Backplane Status	Shows the current condition of backplane activity.
Backplane Integrity	As above, but focuses on any error conditions.
System Manager Interface	Shows the high level status of configuration maps for the entire shelf.
Resource Manager	Shows debug information on system-wide resource allocation and availability. Typically used under the direction of tech support.
Dump Memory Content	Another debug utility to be used under the direction of tech support
Reset Board	Causes the module to reboot, as if it were removed and resealed.

About

The **About Menu** presents a screen of information relating to the Octal Voice Module.

Figure 12-15 Octal Voice Utilities Submenu



The version of software currently running in the module is displayed. Most of the remaining information is for debug use only.

TFTP and Telnet

This appendix describes using the TFTP application for firmware upgrades of the AS4000.

TFTP Application

The AS4000 system supports TFTP (Trivial File Transfer Protocol), to upgrade flash files.

You can use the TFTP command to upgrade a AS4000 with a known IP address. You must be able to reach the AS4000 using TCP/IP through a gateway router. Upgrading the AS4000 using TFTP requires the following:

- A TFTP server and Telnet application in the same LAN segment as the AS4000, or a Gateway address in the AS4000's configuration that makes the TFTP server reachable via a router.

NOTE: *Ensure you have a TFTP server program. Such programs are distributed as shareware, and can be found on the World Wide Web. TFTP programs have different interfaces. Use whatever file transfer steps your program requires to TFTP. The steps detailed next are generic to an open terminal window and may not work with your particular TFTP application.*

1. Log into the TFTP server using whatever method your TFTP server package requires.
2. Use the change directory (cd) command and navigate to the directory on the TFTP server where you placed the new or backup firmware files. For example:
"cd firmware"
3. Use the "Put" command to transfer the new firmware from the its directory (host) to the AS4000 (target). For example:
tftp 207.160.135.121 put C:\firmware\frxv20A.mot
where 207.160.135.121 is the AS4000 IP address.
4. The file transfer can take several minutes. Once the transfer is finished, end the TFTP session by typing "quit".

The command downloads the firmware to the AS4000 with 207.160.135.121 selected, and all LEDs flash when the unit completes the firmware update.

Interfaces and Cables

The AS4000 requires cables and connectors to attach devices to the AS4000 interfaces (ports).

System Manager Interfaces

The System Manager interface supports the following:

- AUI port
- Terminal port
- 10BaseT port
- Modem port

NOTE: Ethernet AUI Port provides a DB-15 pin receptacle for connection using thick Ethernet cabling.

Table B-1 Ethernet AUI Port

1	chassis
2	CI+
3	DO+
4	chassis
5	DI+
6	signal ground
7	not used
8	not used
9	CI-
10	DO-
11	chassis
12	DI-
13	+12V@.25 A (max)
14	chassis
15	not used

Terminal Port Use the terminal port to connect to an external terminal providing RJ-11 modular connectors.

Table B-2 Terminal Port Pinout

Term Port (RJ11)	DCE
1	signal ground
2	CTS (output)
3	RTS (input)
4	RXD (output)
5	TXD (input)
6	chassis ground

10BaseT The Ethernet 10BaseT port provides an RJ-48 connector for connection using twisted pair cabling.

Table B-3 10BaseT Pinout

10BASE-T (RJ48)	
1 transmit pair	TX+
2	TX-
3 receive pair	RX+
4	not used
5	not used
6	RX-
7	not used
8	not used

Phone Line Port The phone line port provides a US standard RJ-11 6-position jack with the active pair on the center pins.

Table B-4 RJ-11 6-Position, 4 Pin Jack

1	vacant
2	NC
3	RING
4	TIP
5	NC
6	vacant

Application Module Interfaces

The standard serial port interface provides (4) DB-25 pin receptacles supporting RS-232, RS-530 or V.35 interfaces.

The Quad DS-1 T1 interface provides (4) RJ-48C modular connectors.

Quad Port Sync Data

Table B-5 Quad Port Sync Data Interface Pin-outs

Pin	RS-232	RS-530	V.35
1	chassis	chassis	chassis
2	TXD in	TXD-	TXD-
3	RXD out	RXD-	RXD-
4	RTS in	RTS-	RTS
5	CTS out	CTS-	CTS
6	DSR out	DSR-	DSR
7	signal gnd	signal gnd	signal gnd
8	DCD out	DCD-	DCD
9	(voltage+)	RXC+	RXC+
10	(voltage-)	DCD+	not used
11	not used	EXT TXC+	EXT TXC+
12	not used	TXC+	TXC+
13	not used	CTS+	not used
14	not used	TXD+	TXD+
15	TXC out	TXC-	TXC-
16	not used	RXD+	RXD+
17	RXC out	RXC-	RXC-
18	not used	not used	not used
19	not used	RTS+	not used
20	DTR in	DTR-	DTR
21	not used	not used	not used
22	(RI) not used	DSR+	not used
23	not used	DTR+	not used
24	EXT TXC in	EXT TXC-	EXT TXC-
25	not used	not used	not used

DB-25 to V.35 Cable Adapters

V.35 interface applications require a DB-25 to V.35 cable adapter. Optional cable adapters are available from Verilink.

- CBE020-00235 - Male DB-25 to Male V.35
- CBE020-10235 - Male DB-25 to Female V.35 (typical).

Table B-6 DB-25 to V.35 Cable Adapters

Signal	Male DB-25	Winchester V.35
Shield	1	A
TXD in A	2	P
RXD out A	3	R
RTS in	4	C
CTS out	5	D
DSR out	6	E
Signal Ground	7	B
DCD out	8	F
RXC out B	9	X
EXT CLK in	10	-
TXC out B	11	W
-	12	a*
-	13	-
TXD in B	14	S
TXC out A	15	Y
RXD out B	16	T
RXC out A	17	V
-	18	-
-	19	-
DTR in	20	H
-	21	-
-	22	-
-	23	-
EXT CLK in A	24	U
-	25	-
*On AMP connectors, this pin is designated as "AA".		

Quad DS-1 T1 Interface

The Quad DS-1 T1 interface provides (4) RJ-48C modular connectors. The pin assignments are listed below:

Table B-7 Quad DS-1 Pinout

Pin	Signal	To/From AS4000
1	Receive (R1)	To
2	Receive (T1)	To
3	Not Used	--
4	Transmit (R)	From
5	Transmit (T)	From
6	Not Used	--
7	Optional Shield Ground	--
8	Optional Shield Ground	--

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Affidavit for the Connection of Customer Premises Equipment to 1.544 Mbps and/or Subrate Digital Services

For work to be performed in the certified territory of

Telco's Name: _____

State of _____

County of _____

I, _____ (Authorized Representative Name), of _____ (Customer Name),
_____ (Customer Address), _____ (Telephone Number),
being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to
_____ 1.544 Mbps and/or _____ subrate digital services. The terminal equipment to be
connected complies with Part 68 of the Commission's rules except for the encoded analog content, and billing protection specifi-
cations. With respect to encoded analog content and billing protection:

- I attest that all operations associated with the establishment, maintenance, and adjustment of the digital CPE with respect to encoded analog content and encoded billing information continuously complies with Part 68 of the FCC's Rules and Regulations.
- The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.
- The encoded analog and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s)/maintainer(s) of the digital CPE responsible for the establishment, maintenance, and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully completing one of the following (Check the appropriate box(es) below):

- ☐ A. Training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- ☐ B. Training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- ☐ C. Independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or
- ☐ D. In lieu of the preceding training requirements, the operator(s) maintainer(s) is (are) under the control of a supervisor trained in accordance with _____ (choose A, B, or C) above.

I agree to provide _____ (Telco's Name) with proper documentation to demonstrate compliance with the information as provided in the preceding paragraph, if so requested.

_____ (Signature)

_____ (Title)

_____ (Date)

Subscribed and Sworn to before me this _____ day of _____, 20____.

Notary Public

My Commission expires _____.

June 2000

P/N 880-503457-001-C



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